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STEEL

The Magazine of Metalworking and Metalproducing

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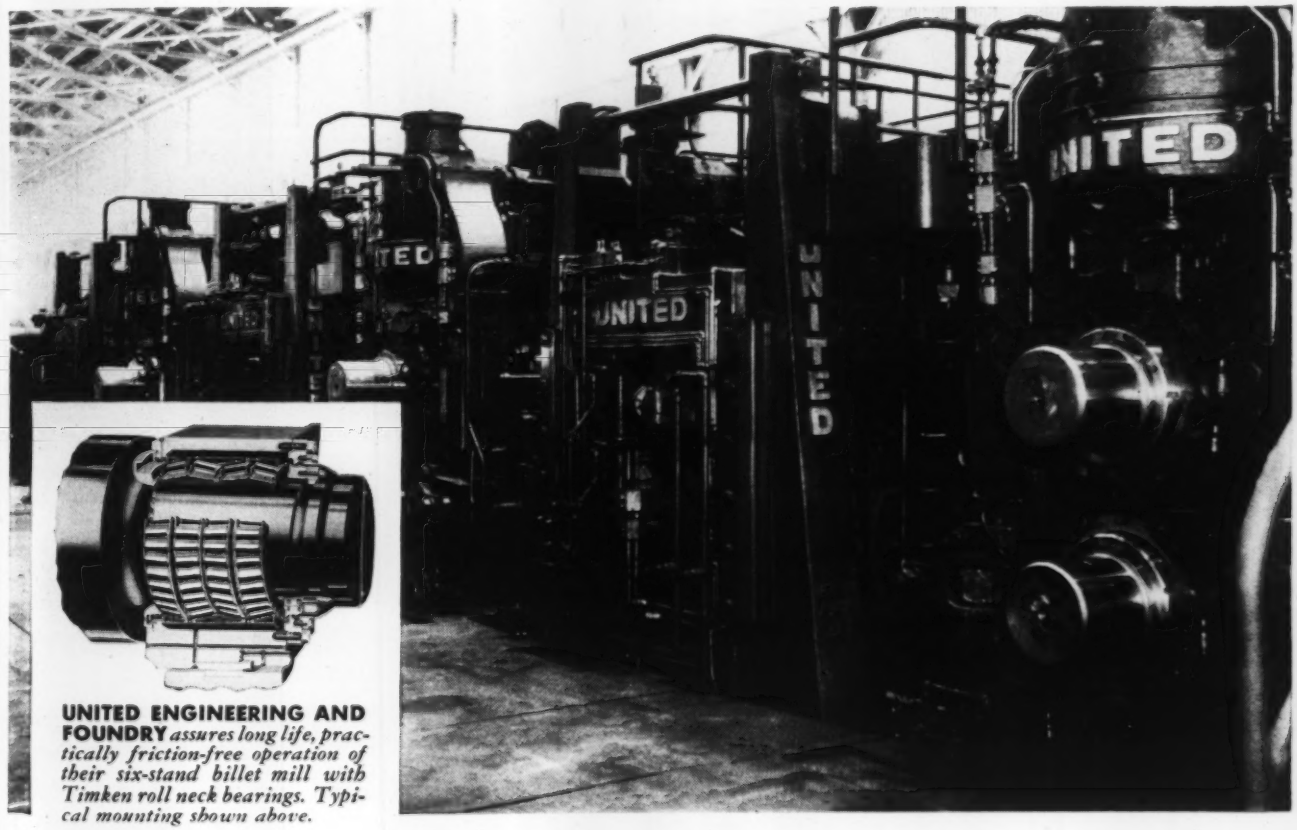

UNITED ENGINEERING AND FOUNDRY *assures long life, practically friction-free operation of their six-stand billet mill with Timken roll neck bearings. Typical mounting shown above.*

How to keep a roll neck from becoming a bottleneck

TO insure continuous production and long, trouble-free performance, the rolls of this United six-stand billet mill are mounted on Timken® roll neck bearings. By reducing friction, Timken bearings permit higher rolling speeds, eliminate roll neck wear.

Tonnage records indicate that the long life of Timken roll neck bearings keeps bearing cost per ton of steel rolled to a minimum. Thanks to balanced proportion design, Timken bearings give greater mill rigidity, permit larger diameter roll necks than ever before possible with tapered roller bearings. Roll neck strength is increased 50 to 60%. Load ratings are increased up to 40%.

Timken bearings permit the use of simple grease lubrication, eliminating complicated lubrication systems. Rolls can be changed more easily and faster. And since Timken bearings take both radial and thrust loads in any combination, no thrust bearings are necessary.

Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

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AT THE IRON & STEEL EXPOSITION
CLEVELAND, OHIO
BOOTHS 104, 105, 106 AND 107
SEPT. 26th THROUGH 29th

TIMKEN

TAPERED ROLLER BEARINGS

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◯ AND THRUST →◯← LOADS OR ANY COMBINATION →◯←

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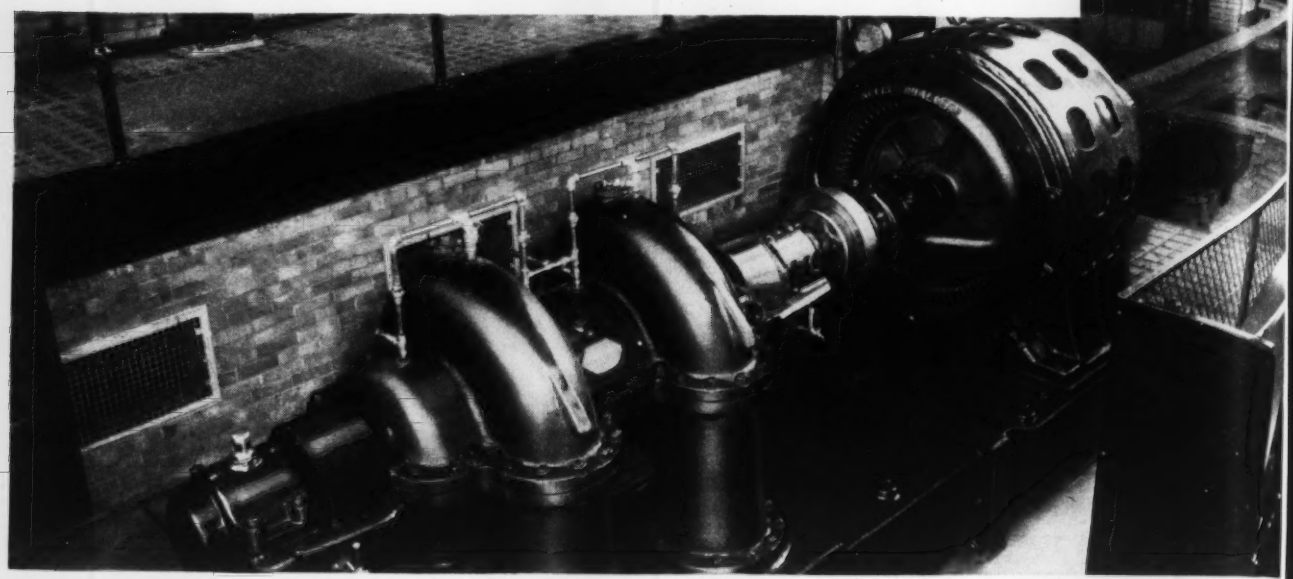

This synchronous motor in the Chestnut Hill Pump Station, City of Erie, Pa., needed rewinding after more than 20 years of service — and it had to be done *fast*. Robertson Electric, A-C Certified Service Shop, was called. In less than a week, the motor was rewound and ready to roll!

FOR FAST, EMERGENCY JOBS or routine maintenance and repair work, you can depend on your nearest A-C Certified Service Shop.

These *independently owned and operated* shops have been carefully selected for their high business integrity, adequate facilities, and experienced personnel. These shops are equipped to give you the best service available on motor repairs in your area.

Call Them For New Motors, Too

For *new* motors — or matching controls — see your nearest A-C Certified Service Shop, Authorized Dealer or District Sales Office. A-3119

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STEEL

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***Next Week*... How U. S. Radiator Makes Radiant Baseboards ... Precision Rings Hot Pressure Welded ... Wheel Dressing Costs Ground Off 40 Per Cent ... Production of Bars—Part II**

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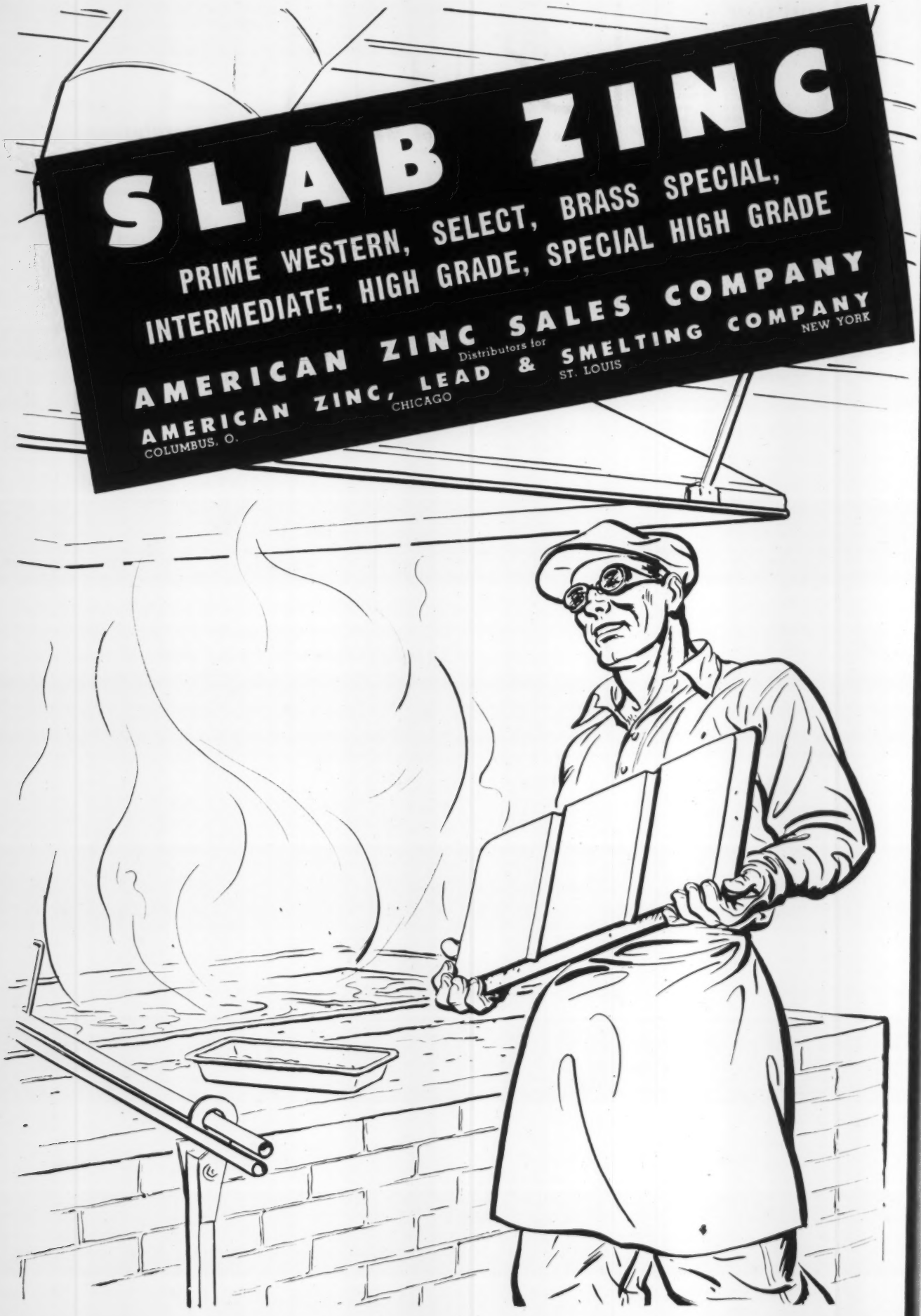
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August 7, 1950

Direct Action

In the current debate on government controls there is a disposition in some quarters to fail to recognize the sharp distinction that exists between the two major problems which controls are intended to solve.

One of these problems is to channel materials, parts, supplies, facilities and manpower to the points where they are most needed. This may necessitate the use of priorities, allocation and possibly rationing. The other problem is inflation. Its solution may require credit restrictions, drastic tax revision, control of prices and wages and perhaps other restrictive measures.

Our experience in World War II proved conclusively that price controls are much more complicated and more difficult to administer than are controls on procurement and use of materials, equipment, etc. In combatting inflation through credit, price and other restrictions we are dealing with matters which affect 150 million persons more or less directly. In diverting materials and supplies to the war effort, a major part of the allocation job can be performed by dealing with a relatively small number of industrial companies. Unless the situation becomes serious enough to justify rationing at the retail level, controls need not affect the individual consumer directly.

Any emergency powers granted the President by Congress and any machinery set up by the administration should take into account the fact that there are many problems of allocation that can be handled much better by the voluntary action of a few than by the ponderous mandatory action of many. An excellent illustration was provided by the action taken at the Blackstone hotel in Chicago on July 28 when in a brief inspiring session American railroad presidents pledged their roads to order 63,000 freight cars immediately.

Here in less than two hours men with authority to act moved to meet the threat of a car shortage resulting from the Korean situation. They did not wait for government action. They accomplished in one sitting more than an ordinary government board would have accomplished in weeks or months.

In the days of emergency ahead we should strive to lick as many of our procurement problems as possible by the quick, effective process of voluntary direct action. There is no point in making the job more complicated than it need be.

* * *

RIGHT TO BE RIGHT: Justice Department brought antitrust suits against eight Detroit foundries for alleged price fixing. The defendants entered pleas of nolo contendere (unwilling to contest), whereupon the federal judge levied fines totaling $49,000.

Attorney for the defendants then issued a statement explaining that his clients had entered their pleas with reluctance, wishing to avoid a long trial which would have cost $75,000. The statement also criticized Justice Department lawyers for instituting criminal action when civil or injunction procedures could have been used if the defendants had indulged in any practices that needed correction. The statement also declared that the defendants, representing less than 1 per cent of national output, certainly were not guilty of price fixing.

Publication of this statement caused the judge to declare: "Lawyers can't come into my court and plead nolo contendere and then issue statements to the papers saying their clients are not guilty."

We make no comment on the propriety of the

(OVER)

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attorney's statement or of the judge's rejoinder. However, hundreds of innocent industrial corporations and executives have pleaded nolo contendere during the past several decades simply because it was the easiest way out of unfair government persecution.

Clarification of antitrust laws and reform in their administration is long overdue. If the lawmakers and the courts are unable to agree on what the laws mean, how can a businessman know what he can or cannot do legally? Benjamin Fairless was absolutely right when he said Congress should restore to the American businessman "his right to be right." —p. 69

* * *

A BREAK FOR EUROPE: This week witnesses the opening of the first United States International Trade Fair in Chicago. About 40 nations are displaying their wares in 190,000 square feet of exhibition space in the Navy Pier and other Chicago exposition halls. The fair will be open from Aug. 7 through Aug. 20.

The Chicago event is on the order of trade fairs which have been successful in Europe during the last 30 years. The nearly 1300 exhibitors from the participating nations are hoping that their displays will stimulate American buying and thus help close the dollar gap. During recent weeks this gap has been narrowed appreciably by U. S. purchases of steel, machinery and other equipment in Europe as a result of the Korean situation.

In easing the pressure on American production facilities, European nations have a golden opportunity to improve their economic situations promptly. It's really better than the Marshall plan. —p. 66

* * *

PROPANE-POWERED BUS: During the past month transit companies have placed orders for nearly 1500 busses. This spurt of buying is welcomed eagerly by the bus manufacturing industry because throughout most of the first half it had been operating at a disappointingly low level. Output for the first six months was only 1837, compared with 3331 in the corresponding period of last year.

Interesting is the fact that 640 of the recently ordered busses will be propane fueled. Propane, a by-product of the petroleum industry, costs about half as much as gasoline and from 10 to 40 per cent less than diesel fuel. Other advantages claimed for propane-powered motor coaches are 50 per cent increased time between engine overhauls, easier starting, faster acceleration, improved engine performance and reduction of obnoxious exhaust odors and smoke.

Performance of the propane fueled coaches will be watched closely by transit officials and bus and bus parts manufacturers. —p. 75

* * *

NOW COME HELIPORTS: Helicopters appear twice in the news this week. U. S. Navy has ordered a small number of a new liaison type of helicopter that will carry a pilot and three passengers. It can be converted into an aerial ambulance for two stretcher patients and a medical attendant.

Los Angeles Airways Inc. thinks it has found the answer to the problem of transporting air passengers from airports to the downtown area. It plans to build a network of rooftop passenger helicopter ports throughout southern California. This will bring downtown Los Angeles within minutes of airports and all suburban areas by passenger carrying helicopters. The first terminal will be atop the 12-story Pacific Mutual Life building. It will be known as the Pacific Mutual Downtown Heliport. The helicopter taxicabs, now in the drafting board stage, will carry 12 to 20 passengers at 125 miles per hour. —pp. 61, 65

* * *

CHROMIUM-ALUMINA: A new metal-ceramic material, properties of which were discussed at the 97th meeting of the American Electrochemical Society, may lend itself to a number of important industrial applications.

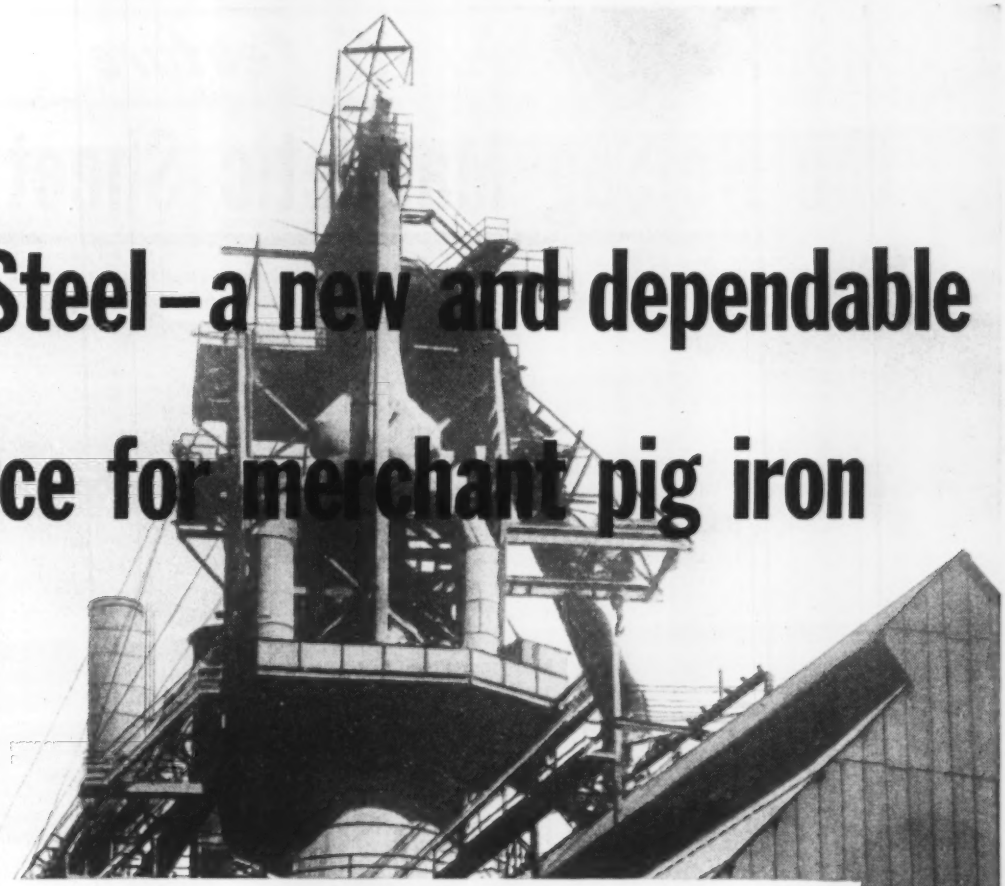
The new material, a chromium-alumina combination, in tests thus far has shown excellent promise for strength resistance to oxidation at elevated temperatures and to thermal shock. Tubes of the new material when plunged into molten steel can withstand the thermal shock of going from room temperature to 2800 to 3000° F without attack by slag or metal. Thermocouple protection tubes for immersion in molten steel, cast iron, brass, bronze and other metals except aluminum last longer than conventional materials because of their excellent thermal conductivity. After 20 immersions there has been no evidence of corrosion from the molten metals.

Probable applications include gas turbine nozzles, crucibles, high intensity burner tips, combustion heater tubes, hot gas sampling tubes and parts for high temperature apparatus. —p. 88

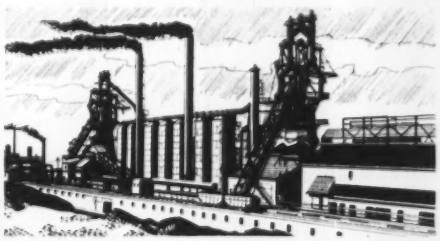
E. L. Shaner

EDITOR-IN-CHIEF

Inland Steel—a new and dependable source for merchant pig iron



NOW, INLAND'S MODERN PRODUCTION FACILITIES AND IRONMAKING EXPERIENCE WILL BE PUT TO WORK FOR MIDWESTERN FOUNDRYMEN



The expanded new blast furnace facilities behind Inland Steel's merchant pig iron production.

A NEW, SURE MIDWEST SOURCE OF SUPPLY

Long known for quality in steel, Inland now offers foundrymen the same dependable Inland standard of quality in merchant pig iron. A completely integrated company, Inland maintains strict quality controls over everything that enters into the production of merchant pig iron—from ore to finished metal.

WHY INLAND KNOWS YOUR NEEDS

For nearly half a century, Inland has produced quality pig iron for its own needs. This experience plus our expanded new facilities now enables us to take care of the merchant pig iron requirements of a great number of foundries.

And to determine the product and service requirements of midwest foundry operators, Inland recently surveyed more than 250 foundries. Result: Inland now has the right answer to midwestern merchant pig iron needs —and we're set up to deliver the goods.

HOW ABOUT DELIVERY?

A wide variety of types of merchant pig iron is normally carried in stock to take care of your needs for immediate shipment. Write for stock list and prices.

INLAND

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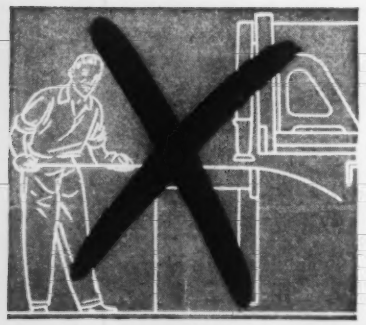
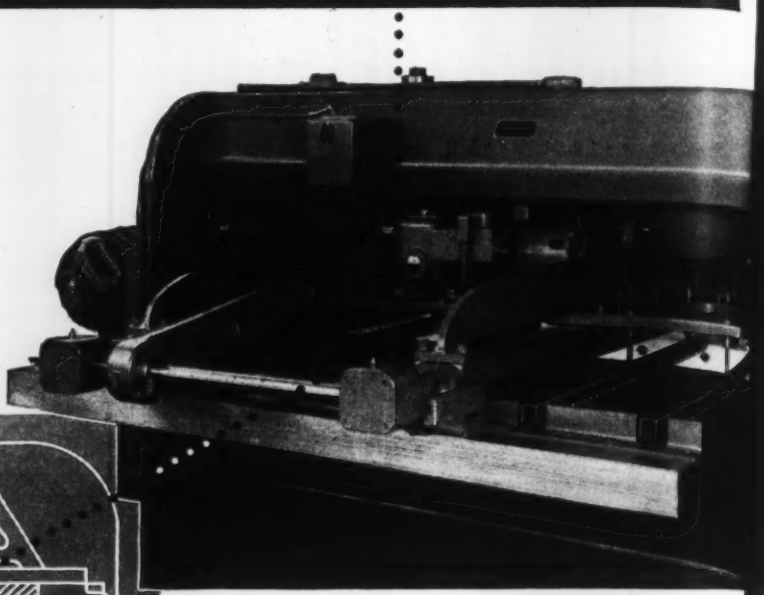
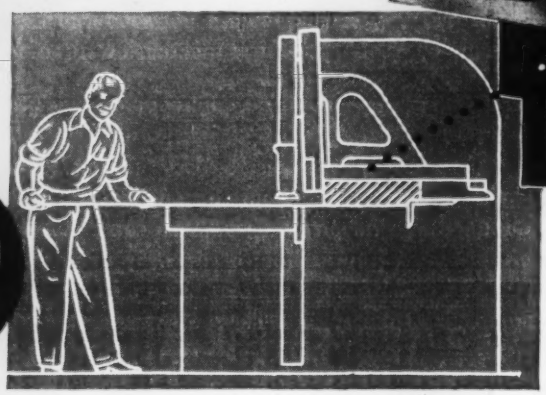


Troublesome Sag





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WRITE for detailed information

Thin steel sheets that sag, and normally are difficult to back gauge, are handled easily and accurately with the Cincinnati Magnetic Sheet Support. Costs are reduced, production increased, and quality of product improved. Maximum capacity: 16 gauge. Range 36″ to 48″; for magnetic sheets only. Available as extra equipment on new Cincinnati Shears.

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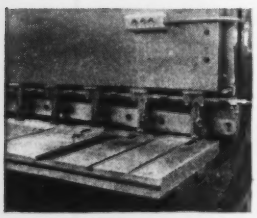

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Tons of pressure hold the work securely—a necessity for accurate cutting.

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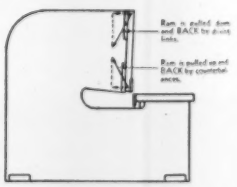
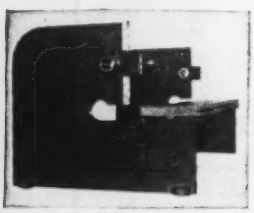
Produces the most accurate shearing in the field and gives six major advantages — including shearing different thicknesses without changing knife clearance.





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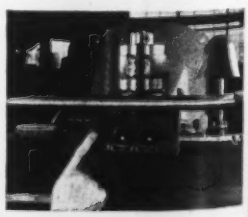

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News Summary

CAUSE AND EFFECT—The government's letter of intent to 14 aircraft manufacturers for $4.3 billion worth of parts and equipment is the first big Korean-born order placed with a metalworking industry . Aside from that, Korea's war-order effect on metalworking is not yet substantial. Chrysler Corp. President K. T. Keller says industry's ability to achieve a full wartime production schedule is being over-estimated (p. 70). Many war-born moves are still in the planning stage, including the railroads' program (p. 55) to buy 122,000 additional freight cars. When that scheme goes into effect, perhaps by next winter, car builders will be turning out 10,000 cars a month and will continue to do so for two or three years. That means double the cars being built now and double the steel being consumed.

SHIP AHOY– Another big steel-consuming program, shipbuilding, is being considered. In 1943, a peak construction year, the industry used 11.4 million tons of steel. A ship program probably is at least a year or two off (p. 56) because the present 1235-ship merchant fleet is adequate for current needs when augmented from the 2200-ship mothball fleet . . . U. S. Steel Corp. will build three new ore carriers and a limestone carrier for Great Lakes trade. The corporation will soon have to begin bringing ore by rail all the way from Minnesota.

PASS THE AMMUNITION—Ammunition has not been a problem in Korea, at least not for the Navy (p. 58). It has kept about $2.5 billion worth in condition since the end of the war. Almost 500,000 tons have been reconditioned annually since 1945.

HELP WANTED?—Don't be alarmed about the manpower situation when a full-scale defense program gets underway, advises the Labor Department (p. 57). There will be dislocations and channeling problems, but Labor Secretary Maurice J. Tobin says our labor force, which is the largest and best trained in history, can meet the challenge. July employment hit 61.2 million, and unemployment dropped to 3.2 million.

FROM FRIGHT—Korea's indirect effect on metalworking activity continues to be terrific (pp. 72-75). STEEL's industrial production index for the week ended July 29 jumped to 215. Steel ingot output is at 100.5 per cent of capacity. Department store sales in the week ended July 22 were 46 per cent above the corresponding week last year. Nearly 195,000 cars and trucks were assembled in the week ended July 29. Foundry equipment orders are mounting. A spurt in ordering by transit companies brightens the outlook for bus makers.

MORE STEEL—Expect more steel when Armco Steel Corp., Carnegie-Illinois Steel Corp. and Republic Steel Corp. complete three expansion jobs (p. 60). Armco will spend about $1.5 million to modernize and expand its Zanesville, O., plant. U. S. Steel's Carnegie will increase the size of 15 open hearths and will install two new turbo blowers for six blast furnaces at Youngstown. Republic will enlarge an open hearth at Buffalo to get 100 tons more per heat.

SELF-SUFFICIENT—Ford Motor Co. will develop more of its own managerial talent (p. 69). A personnel plan already in force is being expanded. Detailed position descriptions will be made of every management job. An individual appraisal will be made of the performance of all management personnel. From this data and because of a more elaborate training program, Ford hopes to be able to pick more of its executives from the ranks.

HERE AND THERE IN INDUSTRY—A court order forces Weirton Steel Co. to withdraw recognition from the Weirton Independent Union, one of the few remaining big independents in the steel industry (p. 57) . . . National Supply Co. has bought the assets of the engine division of Atlas Imperial Diesel Engine Co. (p. 60) . . . Hudson Motor Car Co. workers have turned down a five-year pension and wage contract (p. 58) . . .Norman P. Goss has granted rights to build and operate the Goss continuous casting machine to a British steel producer (p. 59) . . . Europe is looking to the first U. S. World Fair at Chicago, Aug. 7-20 (p. 66) . . . Industrial equipment price rises are coming thick and fast—higher quotations by machine tool builders and electric machinery makers such as GE and Westinghouse.

Production-Engineering News—p. 83 *Market Summary—p. 129*

In Times of Stress—

America is Fortunate In its Warehouse Steel Service

In national emergencies America is fortunate in having a well developed steel warehouse industry with facilities strategically placed throughout the nation—taking care of the day to day requirements of steel users.

As you know, the steel distributor serves as a collective source making steel quickly available to all industry—and thus reducing the need for larger individual inventories. In this way the greatest turnover is developed and a maximum tonnage is always in use.

Naturally only a portion of our country's production requirements can be served from warehouse stocks but very often top production can be maintained only through quick shipments of steel that is missing. The essentiality of these warehouse services has been proven again and again—in every national emergency.

Here at Ryerson, the Korean situation has naturally increased the demand for steel. Requirements, growing directly and indirectly out of the new conflict, are adding to the tremendous demand that has existed—almost entirely without let-up—since the beginning of World War II.

In spite of this increased pressure, we are making every effort to serve steel users promptly. In times like these, shortages are inevitable. But we do have a large though uneven stock on hand in our nation-wide steel service plants. So for any steel you need, contact your nearby Ryerson Plant. We'll do our level best to fill your order.

JOSEPH T. RYERSON & SON, INC.

PARTIAL LIST OF PRODUCTS — BARS • STRUCTURALS • PLATES
SHEETS • TUBING — IN CARBON, ALLOY & STAINLESS QUALITIES

RYERSON STEEL

STEEL-SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI • CLEVELAND
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

STEEL
A PENTON PUBLICATION

Freight Cars: Bidders for Steel

Expansion of freight car fleet may take some of the tonnage you want. Aim is to boost car output from present 5000-a-month level to at least 10,000 by January

SOME of the steel you may want early next winter may be going into freight cars.

The railroads, at the nudging of the Association of American Railroads, have agreed to a program to expand their total number of freight cars by 122,000. That means the production of not only 122,000 cars but enough beyond to take the place of cars that will be retired because of old age and wreckage.

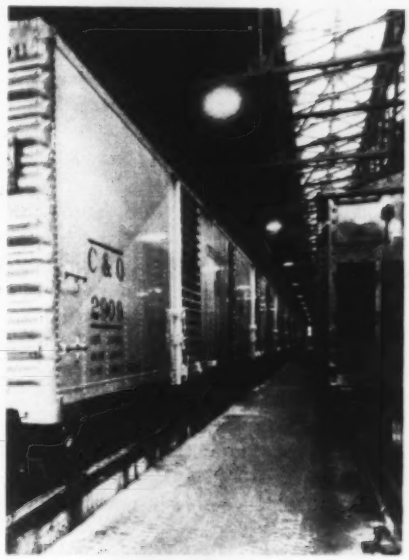
The program agreed to by the carriers calls for expanding their total number of cars from the present 1,727,873 to 1,850,000.

Under this program the production is expected to be stepped up to at least 10,000 cars a month by Jan. 1. It now is only about 5000 a month; in June it was 3874. To expand the car total by 122,000 and provide cars for replacements will require several years at the 10,000-units-a-month rate. Freight car retirements are now at an annual rate of 72,000 units but this will probably decline soon to a rate of 50,000, says William T. Faricy, president of the AAR.

They'll Get Steel—To expand the carriers' freight car fleet by 122,000 will require approximately 2.5 million tons of steel products and castings. There's little question but what the car builders will get whatever steel they need. One Pittsburgh steel executive commented: "If steel is needed for railroad freight cars we'll have to provide it."

On the basis of the breakdown of tonnage by products under the voluntary allocations program in 1948 for freight car construction and repair the new program to expand the freight car fleet by 122,000 cars would require these tonnages of products: Sheets and strip, 256,000; plates, 1,096,000; structurals, 533,000; bars, 342,000; steel pipe, 30,000; axles, 212,000; and billets, 31,000.

Like an Auction—Agreement to the expansion program of 122,000 cars was reached in an auction-like meeting at Chicago, July 28. Asked there what promises they'd make to reach the 122,000-car goal, railroad officials made pledges much in the manner of bidders at an auction sale; some would make one pledge and then up the pledge to help reach the goal. By the time the meeting was over there were pledges to order 63,000 more cars immediately. The railroad industry had 40,000 cars on order July 1, so the total it definitely is committed for is 103,000. Other railroads represented at the meeting indicated they would probably be able to order another 19,000 cars when approvals of their boards of directors are obtained. Some of the 63,000 units pledged at the Chicago meeting have already been contracted for. Others will begin showing up in new order tabulations in a month or so.



MORE FREIGHT CARS
" . . . we'll have to provide the steel"

King Size—One of the largest of these new orders is that placed by Pennsylvania Railroad for 5000 freight cars for delivery as soon as possible. These 5000 cars will cost approximately $27 million. Deliveries are expected to begin in January and to be completed in April, 1951. These 5000 cars are in addition to 10,000 new cars the company previously announced it is acquiring under a rental program involving a commitment of more than $53 million for 15 years. Deliveries on the 10,000-car program are expected to begin in January and to be completed in April, 1951. In addition, Pennsylvania Railroad is reconditioning 17,000 cars, which, beginning Aug. 1, will emerge from shops at the rate of 3000 a month. Pennsylvania's car buying and reconditioning program to help meet industry's current freight car requirements and the demands of rearmament will cost $137 million.

Union Pacific Railroad pledged 3500 freight cars at the Chicago meeting. That will give that line 7500 freight cars built or on order this year, with 2500 to be completed in October and the rest early next year.

Speed-Up—Not only have the railroads vowed to buy more freight cars but they have promised to attain greater utilization of the present freight car fleet. This will be accomplished by avoiding delays in terminals and road hauls, heavier loading and prompt unloading of materials, prompt repair of equipment, prompt placement of embargoes when congestions occur, and observance of car service rules. A further stimulus to more efficient use of freight cars was obtained recently when Saturdays and Sundays were removed as demurrage-free days.

The railroads also set a goal of 50 miles for average daily freight car movement. This is approximately the mileage achieved during World War II and contrasts with 39.3 miles per day per car in 1949.

A freight car fleet expansion program is what Col. J. Monroe Johnson, chairman of the Interstate Commerce Commission, has been urging on the railroads for some time. The sudden rush to buy freight cars, he says, is the result of a combination of increased requirements from military and civilian shippers.

Baldwin Ready To Convert

Baldwin Locomotive Works, Philadelphia, says it's ready to convert to war work.

The company is equipped to do heavy machining and fabricating. More than 5000 unemployed men in Baldwin's immediate area are ready to pick up the work load, says Baldwin President M. W. Smith. In World War II, Baldwin manufactured medium and heavy tanks, gun mounts, gun tubes, shells, armor plate, castings and forgings. Normal peacetime products include steam and diesel locomotives, diesel engines, ship propellers, hydraulic presses and power tools, materials testing equipment, gages and instruments.

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More Shipbuilding? Not Immediately

A revival in repair work will come first as mothballed ships are refitted. Only 17 shipyards now can build big merchant vessels, compared with 80 in 1943

DOES America need to launch a major shipbuilding program? Not yet, says the Maritime Commission. The present merchant fleet, augmented by reserve fleet vessels, is adequate for the time being. But the commission admits it's giving thought to how quickly a major construction program could be started if necessary.

Judging from World War II experience, two to three years would be required before a program would begin to pay off. In 1939 we were about where we are today in our shipbuilding thinking. In 1939 we thought we might need more ships, but not until three years later, in 1942, did a building program get into gear and not until 1943 did it hit its peak (see the chart). Now we think we may need more ships. Will it take until 1953 to get them?

Pared Down—In the U. S. only 17 shipyards are in active service that could build vessels 390 feet and larger. The Maritime Commission owns four other big shipyards that are in a stand-by status. Besides those four, all other big government yards that were built during the war have been disposed of, although some could be reactivated. At the peak of the war, about 80 shipyards were building 300-foot or larger merchant ships. Then, 1,720,000 were employed, compared with about 100,000 now. As of June 30, the U. S. had only 326,034 tons of shipping under construction. Of the 4,549,921 tons under construction throughout the world June 30, Great Britain was building 40.5 per cent. France was the second largest builder, Japan third and the U. S. fourth.

Cargo Lift—As of June 30, the American privately owned and operated merchant fleet numbered 1235 vessels with a dry cargo lift capacity of about 7.3 million long tons. At the height of the war, 4200 merchant-type vessels were being operated under the U. S. flag by private shippers. Another 1000 cargo ships were operated by the Army and Navy. From Pearl Harbor until VJ day, the merchant fleet hauled 268,252,000 long tons.

Of the 1235 vessels in the merchant fleet, 49 are passenger type, 732 are dry cargo type and 454 are tankers. The 1950 merchant fleet is bigger and faster than the 1939 counterpart which had only 1100 ships, many of them obsolete. The fleet before the war was superior to the present one in only this way: It had 134 passenger vessels, compared with 49 now. That situation will be improved when the six passenger liners now under construction in Newport News, Va., Quincy, Mass., and Camden, N. J. are completed.

Out of Mothballs—The 1950 fleet is being augmented by ships from the reserve. Already 65 dry cargo and 12 troop ships are being refitted from the mothballed vessels. The Maritime Commission is relying on this refitting work to help revive the shipbuilding industry and to cushion the shock when and if new ships are needed at the 1943-44 pace. In 1943, 1584 new ships were launched; 1242 in 1944. Only 60 merchant vessels were built at U. S. seacoast yards last year. The present shipbuilding facilities are more than ample to do the refitting work, the Maritime Commission believes. The President has requested that Congress appropriate $18 million to repair reserve fleet vessels.

About 2200 ships are in the reserve fleet. Of these, 1500 are Liberties; the rest are Victory ships and miscellaneous type vessels. The Liberties can do only 9 to 11 knots, so slow that they will be de-mothballed last, if ever. The Victories can do 15.5 to 17 knots. They are the most desirable because of their speed and because they have been in the reserve the shortest time and consequently are in good condition.

U.S. Steel Orders Four Carriers

Two U. S. Steel Corp. subsidiaries will build four ships to carry iron ore and limestone on the Great Lakes.

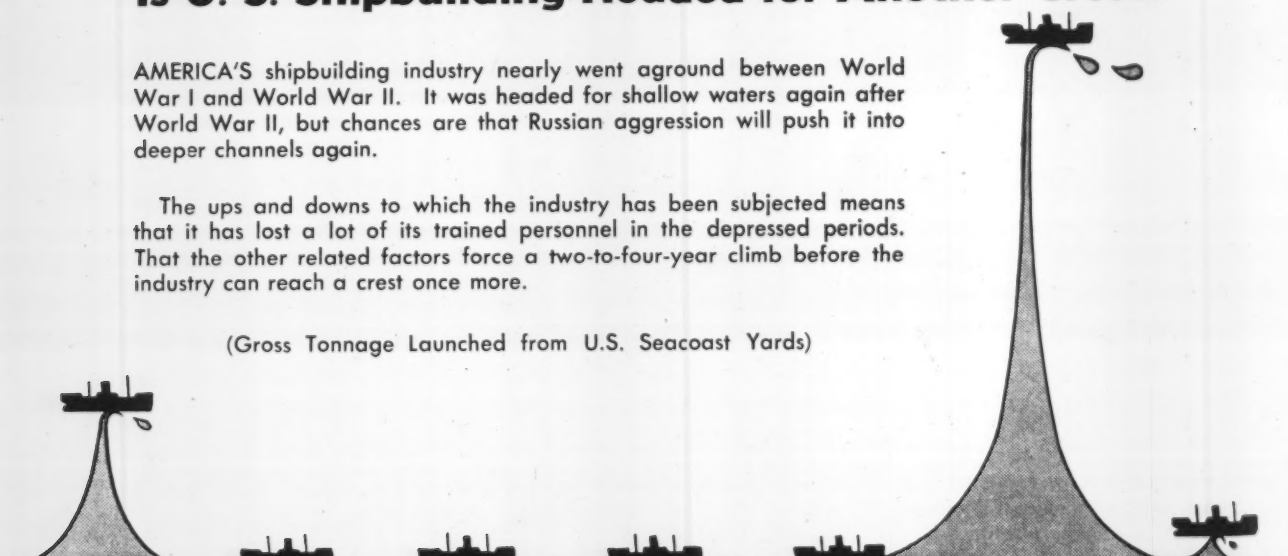
Pittsburgh Steamship Co. will order the construction of three stand-

Is U. S. Shipbuilding Headed for Another Crest?

AMERICA'S shipbuilding industry nearly went aground between World War I and World War II. It was headed for shallow waters again after World War II, but chances are that Russian aggression will push it into deeper channels again.

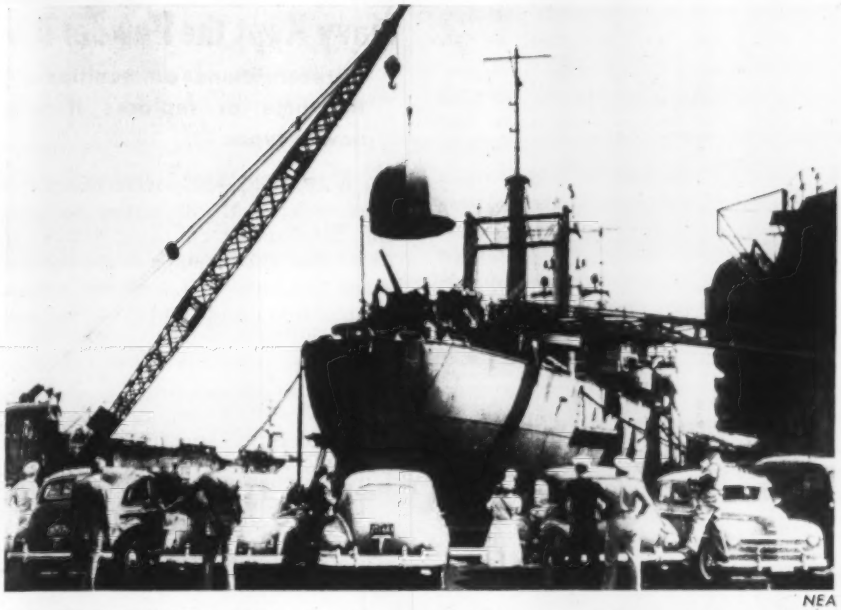
The ups and downs to which the industry has been subjected means that it has lost a lot of its trained personnel in the depressed periods. That the other related factors force a two-to-four-year climb before the industry can reach a crest once more.

(Gross Tonnage Launched from U.S. Seacoast Yards)



1919	1924	1929	1934	1939	1943	1949
3,579,826	90,155	100,632	24,625	376,419	11,448,360	619,357

Source: Lloyd's Register for vessels 100 tons and over.



NEA

OUT OF THE MOTHBALLS: The Navy attack transport *Libra*, put in mothballs at the South Boston Navy Yard annex in 1947, is shown as a derrick lifts a cocoon from a 5-inch gun on its stern. The ship is one of the many that is being shaken out of its mothballs

ard bulk type ore carriers of 18,000 tons capacity each. Bradley Transportation Co., another subsidiary, will order the construction of one self-unloading vessel of 18,000 tons capacity. All four vessels are similar in type to the largest vessels now in use in both classes. Construction of the ships will be completed in time for the opening of the 1952 iron ore shipping season, which normally begins early in April.

Ore To Be Moved by Rail

Rail shipment of iron ore all the way from Minnesota to the Pittsburgh and Youngstown districts will be started by United States Steel Corp. about mid-August. Similar shipments may be made to the Chicago district later this year.

All-rail shipment of ore is necessitated by a combination of these factors: 1. Late opening of lakes navigation season this spring; 2. increased steelmaking capacity which necessitates more pig iron; and 3. high rate of steelmaking operations.

The all-rail movement of ore is expected to total between 1 million and 1.5 million gross tons this year. Railroads, including the Pennsylvania, Baltimore & Ohio, and Pennsylvania & Lake Erie and various other lines among the western systems, will try to supply sufficient cars to carry 10,000 tons of ore a day. A 15-day turnaround time is figured, so nearly 200 opentop cars will be required daily.

To provide the necessary number of cars while meeting increasing demands from other quarters, railroads are stepping up their repair and reconditioning work on bad order equipment.

Export Controls Restored

Expecting that steel scarcities will crop up here and there in coming months, the Commerce Department has decided to restore export controls over carbon steels. Some 70 carbon steel products which were dropped from the positive list in April will be put back on and tonnage quotas set up for the various countries concerned.

The situation was discussed in a preliminary way with a representative group of exporters.

Scrap Imports Increased

Steel industry purchases of high quality foreign scrap have been increased to between 400,000 and 500,000 tons, Robert W. Wolcott, chairman of the American Iron & Steel Institute's Committee on Iron & Steel Scrap, reports.

This scrap is to be delivered over the rest of the year at prices somewhat less than prevail in the American market, he says. Export licenses have been granted on this full tonnage, and ships have been chartered and scheduled to insure delivery of this material before Dec. 31.

Present substantial inventories of scrap and arriving tonnage of foreign material put mills in a fairly comfortable position, he says.

Men for the Jobs

Manpower supply better than in 1940, but channeling workers where needed may be difficult

THE LABOR Department's Bureau of Employment Security says the nation is in better shape now from the manpower standpoint to get defense production underway quickly than it was in 1940.

But the bureau says that while the nation has ample manpower to carry out the defense program the task of channeling workers into the places where they are most needed will become increasingly hard and complicated as the program progresses. But fuller use will be made of the 1800 federal and state job offices.

Busy Hiring Halls—In June before the defense program was considered, factories added workers for peacetime production to their payrolls at a higher rate than in any month since the summer of 1948, says Labor's Bureau of Labor Statistics. The factory hiring rate increased from 44 for every 1000 employees on the payrolls in May to 50 per 1000 in June. The lay-off rate in June declined to a low of 9 per 1000, almost equaling the reduced levels of the immediate postwar reconversion period.

The hiring rate in establishments producing durable goods advanced above the combined rate for all manufacturing, to a high of 54 per 1000 workers in June.

Leveling Off—The total civilian employment remained fairly stable between June and July, says the Commerce Department's Census Bureau. Total civilian employment is estimated at 61,214,000 in the week ended July 8, about the same as in June, but some 1.5 million higher than in July, 1949. The July figure doesn't reflect the impact of international developments.

Unemployment, at 3,213,000 in July, was down slightly from June, about 1 million below the level a year ago.

Weirton Withdraws Recognition

Weirton Steel Co. will withdraw recognition of the Weirton Independent Union in compliance with an order of the U. S. Circuit Court of Appeals at Philadelphia. The court recently ordered dissolution of the union which represents 10,000 workers of the company at Weirton, W. Va.

Thomas E. Millsop, Weirton president, says the company will continue in force the wage rates, pensions and insurance benefits and other advantages which the employees have by

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virtue of the contract between the company and the Weirton Independent Union. All seniority rights will be maintained.

In announcing withdrawal of recognition of the independent union, Mr. Millsop said: "Although we have always believed that our employees have wanted an independent union, we have been trying for more than 15 years to have a Labor Board election to settle the question once and for all. Under the court's order there will be no union recognized for three months unless the matter is settled by a labor board election.

Factory Work-Week Rises

The average factory work-week rose to 40.5 hours in mid-June, exceeding the 40-hour mark for the first time since the end of 1948, says the Labor Department's Bureau of Labor Statistics.

Auto Local Vetoes Five-Year Plan

First refusal of a five-year pension contract in the auto industry developed at a small ratification meeting of the Hudson UAW-CIO local, when objections were voiced over a proposed 3-cent hourly wage raise which was one part of an overall package estimated at the equivalent of 15 cents an hour.

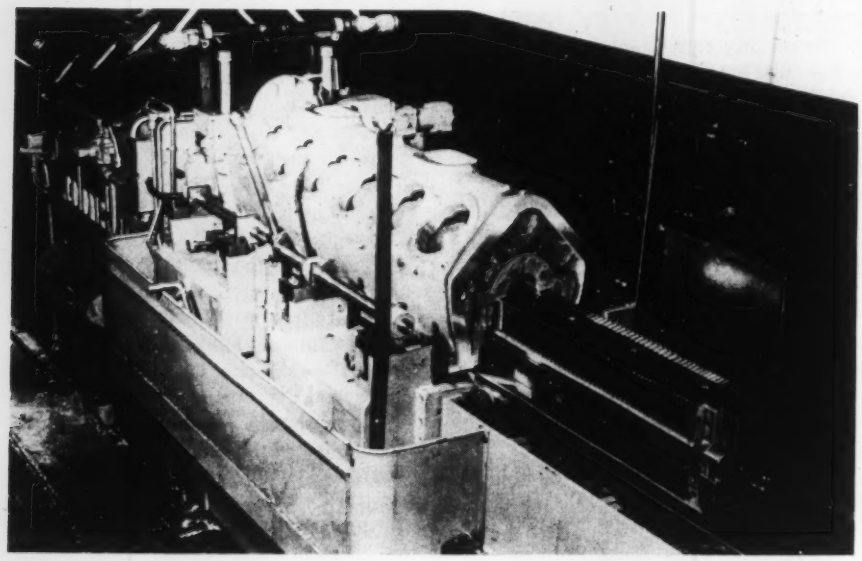
Only a handful of the 20,000 now working at Hudson attended the meeting, but apparently the result will be that negotiations will have to be resumed and new contract provisions determined. The pension-insurance-wage contract patterned closely the General Motors setup, although it did not include any cost-of-living escalator clause. Rejection of the offer came as a complete surprise.

Labor Deferment Policy Shaping

Employers will soon get a better idea of where their workers fit into the government's efforts to build up military manpower.

The Defense Department will announce a policy of temporary deferment—possibly as long as six months—for national guardsmen and reserves whenever there's "reasonable claim" that they are key men in essential war industries.

To guide the Armed Services in administering this policy, the Commerce and Labor Departments will issue lists of occupations considered eligible for deferment.



BROACHING THE SUBJECT: One interesting operation in the new production line for the 12-cylinder air-cooled military engine at Continental Motors, Muskegon, Mich., is the finish broaching of bearing cap channels and inner faces of cross bolt bosses in the aluminum alloy crankcase casting. Six flat surfaces on each of seven transverse webs in the casting (and the radii in the corners of the bearing cap channels) are broached in a single pass with the Colonial Broach Co. equipment in the photo. Tolerances are 0.002 inch for size and 0.0005 inch for squareness and parallelism. About 0.047 inch in depth of stock is removed. Locating pins on the case flange fit into recesses in the platen of the machine to insure proper centering. A single hand-operated lever on the control side of the machine actuates a series of four dogs on each side. They grip the casting flange, holding it firmly against the platen surface. The machine is a 15-ton, 90-inch stroke Colonial horizontal broaching machine. Continental Motors is making the engines that Cadillac will use in the tanks it will build

Navy Kept the Powder Dry

It reconditions ammunition all the time or replaces it with newer types

IT WASN'T LONG after the President ordered U. S. forces to meet the Communists charging across the 38th parallel that ships were standing along the dock of U. S. Naval coastal ammunition depots and overseas bases to take aboard bombs, rockets, projectiles and cartridges needed by ships and planes of the fleet.

There was a simple explanation: An ammunition surveillance program put into effect by Navy's Ordnance Bureau in 1945 had kept large stocks of World War II ammunition in readiness for just such an emergency. Even though limited by the military budget and the priorities given for research and development of new weapons, Naval Ordnance used a good deal of available funds to keep about $2.5 billion worth of reserve ammunition in serviceable condition.

Perishable Bullets — The Navy points out that ammunition is perishable. But it confesses that the rate and extent of deterioration is not known for all types of ammunition—for varying reasons: Manufacturing differences, previous handling, adverse stowage, etc. So, the Navy set up quality control laboratories at a number of ammunition dumps where ammunition returned from the fleet and stocks stored at the depots could be analyzed quickly.

The modern testing methods helped Navy Ordnance find out just how good hundreds of thousands of tons of ammunition really were. The sampling of only a fraction of 1 per cent of the material under surveillance gives the Navy the dope on the condition of the ammunition at any specific time, the remaining useful storage life of the material and the proper time to repair specific defective items.

Defense in Depth, Too—Reconditioning of ammunition is going on all the time at all active Naval ammunition depots, located on the East and West Coasts and at several inland areas. The reconditioning varies from minor inspection and cleaning to complete breakdown and reassembly. Defective components like fuses, primers, cartridge cases, wads and explosive fillers are replaced.

Almost 500,000 tons of ammunition have been reconditioned annually since the end of the last big war—and at a cost of about 3 per cent of the replacement value of the items that make up the fire power of the fleet. Obsolescent ammunition is being re-

placed as rapidly as possible with newer types to keep pace with the more advanced weapons developed since World War II, particularly for air defense and antisubmarine warfare.

Continuous Casting for U.K.

The Goss process is based on experimental work at an Ohio steel plant

NORMAN P. GOSS, Cleveland, has granted rights to build and operate the Goss continuous casting machine to an unidentified British steel producer. The British company will grant licenses in some foreign countries, including Australia and India.

The British company will build a 4 x 16-inch mold, 5 feet long, capable of casting 1000 lb a minute. This machine is based on experimental work at an Ohio steel plant. Many trials were made before the process for casting slab ingots was developed successfully. Slabs with nearly perfect surfaces were cast. Inner structure was fine-grained, dense and solid.

Die In Short Sections—Several patents have been granted covering this development. For example, patent #2,510,100 provides a die composed of short sections supported in a way to prevent distortion of the sections, maintain exact alignment and substantial constancy of mold section, even though the mold is undergoing continual shock from a thermal standpoint. The mold also can be internally lubricated in several ways, even though the slab is moving through the mold. Other patents are pending.

While the patents cover round, square, and rectangular sections, experiments showed that all pouring problems are eliminated when casting large slab sections for strip, plate, and the like, using only conventional pouring means. For instance, a mold 4 x 25 inches and 6 feet long, can cast slabs in excess of 1 ton per minute.

Eyed by U. S. Producers—Because of this feature, several prominent American steel companies have expressed interest in the Goss process. They believe the process is feasible in connection with electric furnaces erected near adequate steel scrap supplies and close to consumers' plants. The method also affords a wide range of steel tonnage at a low conversion cost.

While the method of continuous casting would eliminate the blooming mill and its associated equipment, continuous casting methods were not directed to this end, but to provide the steel industry with a cast structure of greater uniformity, improved surface, and increased yield. This would all be reflected in lower production costs, and an improved product going to the consumer.

The Goss process was described in STEEL, March 6, 1944. However important improvements have been made since. Mr. Goss is president of the Mayfield Research Corp., 1191 SOM Center Rd., Cleveland 24.

NEA

IN ANY KIND OF WEATHER: The F-94, all-weather jet fighter plane is shown as it takes to the air from Van Nuys, Calif. F-94's are capable of tracking down enemy aircraft by use of radar located in the plastic nose. Besides the pilot a radar operator is located in the rear cockpit. Built by Lockheed, the F-94 is a radically designed version of the F-80 Shooting Star. It is powered by an Allison J-35 engine. Afterburning considerably boosts the power of the engine

Machine Tool Sales Soar

THE MACHINE TOOL business is sharing in the wave of civilian buying touched off by the Korean war.

Indicative of this upturn in machine tool activity is the last-minute cancellation of nearly 10 per cent of the reservations that had been made for the five-day machine tool sales conference last week at Cornell University, Ithaca, N. Y.

David Ayr, president, National Machine Tool Builders Association, explained that this sudden rise in machine tool business activity is due only indirectly to the Korean war, the buying being much in the nature of the war-scare buying that has hit other markets. War orders, though, will come eventually, he believes.

Another One Coming—The conference at Ithaca was the third in an annual series of sales refresher courses launched in 1948 by the Sales & Service Committees of the National Machine Tool Builders Association and the American Machine Tool Distributors Association. The second section of this 1950 conference will be held at Purdue University, Aug. 21-25.

Among suggestions on how to sell was this one by Thomas R. Rudel, president, Rudel Machinery Co., who is a proponent of what he calls "the good, old-fashioned technique of freehand sketching": Practice sketching upside down so you can face the prospect and have the sketch materialize in an upright position for him.

"Dear Sir:" Other sales aids getting attention at the conference included correspondence. With letters comprising 80 to 90 per cent of the activity of machine tool sales departments it is necessary to make them interesting as well as accurate and concise, Dr. Charles Rehor, Western Reserve University, emphasized.

A man might have all the material sales aids at his disposal and still not be a good salesman. So to picture what the ideal machine tool salesman should be Charles M. Clark, assistant to the sales manager, Cincinnati Milling Machine Co., said: He is one who makes himself so indispensable engineeringwise and otherwise to his customers that they come to regard him as an unofficial member of their own production and tool engineering staffs. "You can achieve this," Mr. Clark explained, "only by building confidence through constant helpful contact with customers and by mentally sitting on their side of the table."

Wire Mill Planned for Texas

A steel and zinc wire mill is to be established in the northern Texas town of Sherman by C. H. Roman of Pekin, Ill., and his brother, Herbert E. Roman, of Worcester, Mass.

They will call their firm the Sherman Steel & Wire Co., and expect to have their mill operating in 60 to 90 days.

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Atlas Engine Sold

Firm's diesel manufacture will be moved to Springfield, O. National will broaden its line

NATIONAL SUPPLY Co., Pittsburgh, bought the assets of the engine division of Atlas Imperial Diesel Engine Co., Oakland, Calif. The purchase includes the name, trademarks, patents, certain machinery and equipment and the inventories throughout the United States and Canada from Los Angeles, Calif., to Halifax, N. S. and from Ketchikan, Alaska, to Houston.

National Supply long has been a manufacturer of diesel and gas engines at its Superior Engine Division, Springfield, O. It is to there that production of Atlas Imperial engines and service parts will be transferred as rapidly as possible.

National Supply, large manufacturer and distributor of oil field machinery and equipment, will thus broaden its horsepower range of diesels. Atlas diesels range from 5 to 1000 horsepower; Superior engines range from 230 to 1600 horsepower. Atlas history dates back to 1905.

Armco Expanding in Zanesville

Armco Steel Corp., Middletown, O., will spend about $1.5 million to modernize and expand its Zanesville, O., plant. Charles R. Hook, company chairman, says engineers finished the plans. Construction work will be completed within the year.

Mr. Hook estimates that 100 new permanent jobs will be created at Zanesville where the demand for electrical steel was more than the plant could produce. Capacity will be expanded by the new construction.

New Lincoln-Mercury Plant

Lincoln-Mercury Division of Ford shortly will begin construction of a new assembly plant on a 179-acre site west of Wayne, Mich. It will have a production capacity of 640 cars a day and employ about 3000. It will house all Lincoln assembly operations now carried out at the Lincoln plant in Detroit, and those of the Mercury assembly line at the Ford Rouge plant. The unit is the fourth to be built by the division in a three-year period and will serve the central sales region.

Dravo Expands Wilmington Yard

Dravo Corp. expanded its Wilmington, Del., shipyard on the Christina river when it added a floating drydock. The company says the new steel dock will enable faster, more complete repair and maintenance of various types of hulls, chiefly scows, barges and lighters.

The drydock was previously owned and operated by the U. S. Navy. Each outrigger is 105 feet long overall and 43 feet wide inside. Wing walls are 17 feet high. Dravo has operated its Wilmington yard since 1926. In the last three years the company has given limited repair service to East Coast operators.

NO BOMBING AFTERMATH: Instead workmen shown here are dismantling the No. 15 coke oven battery at U. S. Steel's world's largest steel mill in Gary, Ind., operated by Carnegie-Illinois Steel Corp. This work is part of the regularly scheduled modernization and improvement program carried on annually by U. S. Steel from coast to coast. A new battery of 77 coke ovens will replace No. 13 as well as No. 15

More Steel at Youngstown

Carnegie-Illinois Steel Corp. will sharply increase its iron and steel capacity at its Youngstown plant. It plans to increase the size of its 15 open hearths and will install two new turbo blowers for its six blast furnaces, increasing iron output from them by 800 tons daily.

American Bridge Co. was given a contract for erecting the turboblowers and is starting work this week. Work will require about 10 months. Two old boiler houses are being razed to make way for the new equipment.

Carter Gets Corsicana Plant

Carter Products Corp. acquired a new plant in Corsicana, Tex., for production of Carlon flexible plastic pipe. Brigham Britton, company president, says the plant is scheduled to start operations within the next 30 days. Plant's production will be utilized to supply plastic pipe demands in Texas and the entire southwest area of the United States.

Republic To Enlarge Open Hearth

Republic Steel Corp. will enlarge an open-hearth furnace at its Buffalo district steel plant to gain an additional 100 tons per heat.

Right now the Buffalo plant has four 200-ton and five 100-ton furnaces. The furnace to be enlarged is one of the latter. The reconstruction of the furnace will provide an estimated annual increase of 60,000 tons of steel.

Monarch Approves Additions

Directors of Monarch Machine Tool Co., Sidney, O., approved immediate additions to plant and equipment aggregating $500,000.

"The expansion," Jerome A. Raterman, president, says, "represents a decision on our part to increase our capacity immediately in order to be prepared for future production requirements. Current orders, which represent in the main modernization programs long delayed but now urgently being pushed toward completion, have already raised our backlog to a level five times that of Jan. 1, and the highest point since 1945. What we may be expected to produce on behalf of military preparedness is thus far purely a matter of conjecture."

The program involves the replace-

ment of 30,000 square feet of old plant structure with new, plus the construction of 12,000 square feet of plant area for the rearrangement and improvement of present manufacturing processes.

It is the eighth expansion to be made in the Monarch plant since 1940.

Republic May Install Big Blower

Proposed installation of a 125,000 cubic foot per minute turbo blower at the Cleveland No. 5 blast furnace was announced by Republic Steel Corp.

The blower will be the third of such size installed on furnaces operated by Republic. These blowers are nearly 50 per cent larger in capacity than those commonly employed in regular blast furnace practice and permit the operation of furnaces by the so-called "high top pressure" method. By this operation increased tonnages of pig iron may be produced more efficiently and with less coke consumption.

The Cleveland No. 5 furnace was built by Republic for the United States government during World War II. It has been operated by lease or sublease by Republic since.

... And No Sunday Drivers

One of the airlines' knottiest problems has been the transporting of passengers through the traffic snarls of downtown areas and out to the airports. Now Los Angeles Airways Inc., Los Angeles, thinks it has the problem licked. It plans to build a network of rooftop passenger helicopter ports throughout southern California.

Clarence M. Belinn, president, says the heliports will bring the downtown area of Los Angeles within minutes of all suburban areas by passenger-carrying helicopters. Los Angeles Airways is no slouch at helicopter service: Since 1947 it has carried over 8 million pounds of mail between California cities. About 6 million pounds were carried in 170,000 landings and takeoffs from the rooftop of the Los Angeles terminal postoffice.

The first passenger terminal will be atop the 12-story Pacific Mutual Life building in downtown Los Angeles. It will be known as Pacific Mutual Downtown Heliport. Its opening is expected to coincide with the delivery of new 12 to 20-passenger, 125-mile-per-hour helicopters now on the drafting boards.

Refrigerator Plant Doing Well

Deepfreeze Appliance Division of Motor Products Corp. reports rapid progress of its new refrigerator plant being erected on the Skokie highway at North Chicago, Ill.

Austin Co. is designer and builder of the 236,000-square foot, single-story, flat-roofed structure, scheduled for completion by Dec. 1. One unusual feature of the plant, designed for highly flexible, straight-line production, will be the location of drying ovens overhead on the roof where they will rest directly on the regular building trusses. The arrangement will increase available floor space for other operations by as much as 10,000 square feet.

PHILIP D. ARMOUR JR. CAN GET TO WORK EARLY
. . . he beats the traffic snarl in downtown Chicago

National Moves Operations

National Steel Products Co. transferred all operations to its new combined warehouse and plant building on a 10-acre site in the industrial district of Houston, N. A. Fitch, vice president and general manager, says. National Steel Products Co. is a subsidiary of National Steel Corp.

The new plant consists of three large Quonset buildings which were fabricated by Great Lakes Steel Corp., also a division of National Steel Corp. The principal building is 450 x 520 feet and has a floor area of 230,000 square feet—approximately five acres under one roof. This building contains the warehouse and also facilities for the manufacture of down-spouts, gutters, and other roofing materials and rain-carrying equipment.

New Alloy To Be Unveiled

A major steel producer will soon unveil a new heat-treated low carbon, multiple alloy steel, combining high strength with ductility and toughness even at subzero temperatures.

The alloy is especially suited for fabrication where welding or gas cutting is involved requiring no special preheating or postheating treatments. It is produced primarily in plate form in thicknesses up to 6 inches, although it may also be furnished as bars or forgings.

The high yield strength achieved is about three times that for straight carbon steels and double that of low-alloy high-strength grades. The alloy offers cost saving advantages through reduction in dead weight for such applications as earth-moving and coal mining equipment, pressure vessels and welded members where toughness under stressed conditions is necessary. The price of the new alloy exceeds that of high-strength low-alloy steels, but is well under that of stainless.

Fewer Nails for California Homes

California's housing boom, which showed no signs of abating because of tighter credit controls, is beginning to run into shortages reminiscent of the last war. Although scarcities are spotty and vary from area to area, indications are they'll become worse unless home building begins to be curtailed soon. Competition for materials from armament and other wartime industries are expected to hit harder within a short time.

The Home Builders Council of California says principal shortages are in nails and in plasterboard.

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Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Commerce has chosen committees—in blueprint—to handle the job of allocations. Labor and Agriculture are readying plans. Everything now waits for Congress' action

ALTHOUGH an allocations or priorities program is still in the incubation stage and it isn't possible yet to say just what will be hatched, one thing is certain: The White House will move fast in putting to work whatever powers it gets.

An administration spokesman told STEEL: "We will move immediately to set up policies governing the distribution of critical and strategic materials. Just as soon as possible—for instance—we will act to clarify the steel supply situation.

"In the meantime steel consumers will be well advised to exercise restraint. After Congress has acted, it should take only a few weeks to set up a distribution blueprint and let consumers know where they stand on supplies for the rest of the year."

Slight Disturbance—The spokesman was not prepared to discuss the extent of market disturbances that may result from application of priorities and allocations. The expectation is that: On the basis of present military requirements, the disturbance may be slight. The tonnage to be taken from the free market under priorities should not be so great as to work any great hardships on civilian consumers.

But an accurate assessment will have to wait on the planning of the Joint Chiefs of Staff and until the whole requirements situation has been thrashed out with the steel industry.

The Heart of the Matter—While waiting for Congress to determine how controls will be formulated government departments and agencies are readying their plans: Commerce for industry, Labor for manpower, Agriculture for food, etc.

The heart of the Commerce Department's plan to apply emergency powers to industry is in the industry committee system. Policy decisions would be reached only after thorough discussion with the industries involved. Representatives of the industries would be called in to carry out the policies. To the largest extent possible, co-operative rather than mandatory procedure would be employed.

Blueprint of a Committee—Commerce already has determined membership to committees in critical industries. The creation and makeup of these committees will be announced as soon as the President gets and signs the emergency powers act now shaping up. The committees that have been placed in the blueprint—complete with names of companies and individuals—are concerned with basic materials, particularly steel.

Later on, as the needs arise, similar committees will be set up for the machine tool industry and other segments of metalworking.

How It Shapes Up—Here's what the steel setup probably will look like:

It might embrace a committee of presidents of steel companies to confer with Secretary Sawyer on top policy matters. Right under that will be a top working-level group of steel executives to work with H. B. McCoy, director of the Office of Industry & Commerce. Under it will come many product committees to work out priorities and allocations programs.

So far administration plans are to create committees to work exclusively on priorities and allocations matters. If Congress provides price control authority, further study will be in order to carry out that mandate.

No Coal Controls Needed

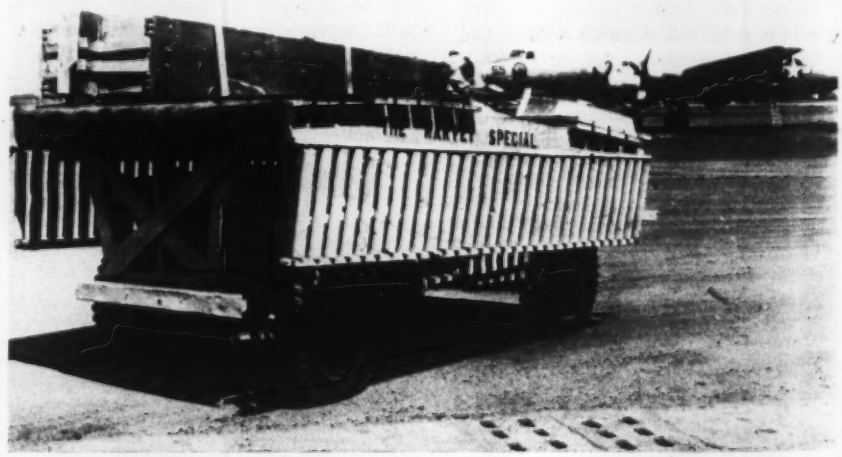
The National Security Resources Board has no plans for coal controls, says American Coal Sales Association.

If, as and when any control of coal distribution or price is required and can be legally accomplished, the association thinks such control will be handled by the Interior Department. "There is absolutely no need for any kind of controls of the coal industry for the present," says the group.

The National Coal Association says the bituminous industry has its plants and facilities ready now to produce all the coal needed.

Be Careful with Beryllium!

Used principally in producing strong, heat-treatable copper-base alloys for electrical contacts, clips, small springs and other metallic



NEA

STILL THE MOTHER OF INVENTION: When the first Willys universal Jeep was unveiled July 19, 1945, at Charles Sorenson's farm just over the Michigan line from Toledo, the company proudly listed 25 agricultural and 17 industrial and general jobs that the Jeep could do. A month later the list of uses had doubled. New uses are devised every day, some by Willys, some by Jeep owners. Witness this latest adaptation of a Jeep for a job: It is the "Harvey Special." It was created because of the necessity for quickly loading and unloading C-47 cargo carriers now "airlifting" supplies for United Nations forces in South Korea. The scene is at a 5th Air Force installation in Japan. The Jeep got its name from Marvin Harvey, executive officer of the base. The oddly shaped mobile platform has already shown its worth. GI ingenuity planned and designed the Special

parts, beryllium first became industrially important in the last war. Berylliosis, or beryllium poisoning wasn't recognized as a serious occupational hazard, though, until doctors discovered that war plant workers handling the metal sometimes developed toxic reactions in the lungs and skin. Now the Bureau of Mines has come out with a publication reviewing the industrial health hazards that come from handling beryllium and its compounds.

Cases of berylliosis have been reported most frequently in processing plants, but the hazard is also present in varied occupations: Fluorescent lamp manufacture, laboratory research preparation of lamp phosphors, manufacture of ceramics with the metal or its alloys and in the atomic energy industry. Every once in a while the disease strikes persons living in the vicinity of beryllium-producing plants. Emphasis must be placed on prevention because medical science hasn't yet developed a specific treatment for berylliosis.

A free copy of Information Circular 7574, "Review of Literature on Health Hazards of Beryllium and Its Compounds," may be obtained through the Publications Distribution Section of the Bureau of Mines, 4800 Forbes St., Pittsburgh 13.

Tools of War: Rubber, Copper

Eight members of Congress, spearheaded by Rep. Earl T. Wagner (Dem., O.), appealed to the President for a directive to the State Department to get full British support for United Nations and United States policy in Asia.

In the letter to the President, the members of Congress charged Britain with continuing to permit exports of rubber, copper, lead, tin and machinery to Communist China. The letter described the commodities as "tools of war that, eventually may become weapons to kill American youths."

Aircraft Employment

Aircraft manufacturing—before the the Korean conflict it was primarily a defense industry — maintained a stable employment level in the first five months of 1950. The number of production workers averaged 123,100, a 3 per cent decline from the average of 127,300 in the like period of 1949.

How come the decline? The Bureau of Labor Statistics says: Spending by the Armed Forces for military aircraft in fiscal 1949-50 was lessened. There was a lull in introduction of new models. The demand for civilian aircraft kept going down.

Chief influence on the trend of employment in the postwar period was the level of spending for military aircraft. As defense spending went up, employment did, too. The number of production workers rose from 104,000 in July, 1947, to a peacetime peak of 130,000 in July, 1949.

There's a slight hitch to total industry estimates of employment, though: They tend to hide different regional trends. The trends come from the concentration of the industry in a few large companies that specialize in producing particular models and depend on a single customer—Uncle Sam. So, large orders for any or several models of aircraft in any one period may show different regional trends.

Helping Hand-Out

ALL THE WORLD loves a giver, and part of the world—about 2000 per month—writes to Paul G. Hoffman, Economic Cooperation administrator; some of the world asks to share in American largess.

Some of the letters come from American businessmen, educators, students, heads of cultural organizations and just ordinary citizens asking for information. Several though, appear persistently from an Italian who says he thought of the Marshall Plan first but is willing to settle for 10 per cent of the aid received by Italy.

One correspondent, believing Mr. Hoffman liked careful planing asked for a baby bed. He was going to be married. Other requests: Babby buggies, prefabricated homes, statues, reimbursement for stolen inventions, casual loans for a few thousand.

Navy Orders New Helicopter

The Navy ordered a small number of a new liaison type helicopters that will carry a pilot and three passengers. It can readily be converted into an aerial ambulance for two strecher patients and a medical attendant.

The new helicopter, designated HOK-1 will be built by Kaman Aircraft Corp., Windsor Locks, Conn. Kaman won a Navy-sponsored design competition for that type of helicopter. It has twin intermeshing rotors; the pitch of the rotor blades is changed by a small servo-control. A single engine will drive both rotor blades. The HOK-1 will have a gross weight of 3500 pounds.

More Aviation Fuel On Tap

Interior Secretary Oscar L. Chapman advised petroleum refiners who are operating aviation alkylate plants to operate at full capacity to assure an adequate supply of high octane aviation fuel for military use.

He also urged refiners who are currently blending grade 115/145 avgas to try to increase output by buying additional alkylate. The secretary wants refiners who blend aviatio alkylate in engine gasoline to look for other substitute blending stocks that they'll need to keep up their stocks of automobile gas.

Small Business Shares in ECA Aid

An Office of Small Business study shows manufacturing firms employing less than 500 persons got $44 million in direct ECA payments or 20 per cent of all payments to manufacturers within a selected four-month period, April-May and November-December, 1949.

Of the $823 million of ECA payments to American suppliers, 71 per cent went to non-manufacturing concerns, 27 per cent to manufacturers and 3 per cent to unclassified companies.

Among the commodities of which small business got a favorable slice were zinc and zinc products, 29 percent; machine tools, 22 per cent; special industrial, office and miscellaneous machinery, 21 per cent; and construction and mining equipment, 20 per cent.

Only small proportions of payments went to small firms in these lines: Agricultural equipment (except tractors); iron and steel mill materials and products; copper and copper products; lubes, greases and other liquid petroleum products; motor vehicles engines and parts; and wheeled agricultural tractors.

'Trade With France' Directory

The Office of Small Business released a booklet, "Trade with France —A Businessman's Directory," that should be valuable to every American supplier trading or contemplating trade with France. The booklet was prepared by the ECA Special Mission to France.

If you want a copy, write to any of the field offices of the U. S. Commerce Department or to ECA's Office of Information, 800 Connecticut Ave. N. W., Washington.

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Europe Looks To First U. S. World Fair

Foreign countries hope the Chicago show will help close the dollar gap already narrowed by increased American purchasing overseas

EUROPEAN nations hope the first U. S. International Trade Fair at Chicago Aug. 7-20 will help close the dollar gap that has already been narrowed by increased American buying abroad. U. S. purchases of steel and machinery in Europe have been spurred by the Korean war.

France, Germany, United Kingdom, Italy, Sweden, Netherlands, Yugoslavia, Belgium, Greece, Austria, Norway, Denmark, Turkey and the Saar are among the 40 nations that are taking 190,000 square feet of space at the Navy Pier and other Chicago exhibition halls.

Fish for Sales—Nearly 1300 exhibitors from those countries will attempt to lure American buyers for foreign-made toys, recreational equipment, home appliances, musical instruments, farm equipment, autos and other transportation equipment, machine tools, general and special industrial machinery, electrical goods, scientific apparatus and plumbing, heating and air conditioning equipment.

The Chicago fair is privately sponsored, although it has federal, state and municipal support. President of the sponsoring group, First United States International Trade Fair Inc. is I. S. Anoff, president of Albert Pick Co. Inc. The fair's executive director of foreign affairs is Dr. Jacques Kunstenaar, on leave of absence from the U. S. Department of Commerce.

Old Grandad — Historically, the forerunner of the modern international sample fair is probably the Leipzig, Germany, Fair which converted its medieval trading market into the first modern international trade fair in Europe—a market place where samples of goods were exhibited to wholesale buyers instead of wares that could be taken home immediately by the consumer.

Between the two World Wars, at least 30 fairs were successfully established in Europe. The post World War II revival has been phenomenal. The Netherlands Fair at Utrecht, for example, now occupies more than twice as much exhibit space as did the last fair before the war in 1939.

Off to the Fair—Five big Western European fairs are at Utrecht; Brussels, Belgium; Milan, Italy; and Paris and Lyon, France. More than 32,000 exhibitors displayed at those five shows in 1950; more than 28,000 in 1949 and nearly 26,000 in 1948. At Utrecht, Brussels and Milan, 1,262 U. S. firms exhibited in 1950, 1,078 in 1949 and 938 in 1948.

Ruhr Flooded with Orders

Ruhr steel producers are being flooded with orders from the U. S., Latin America, Australia, India and Pakistan. Exports are 40 per cent higher than at the beginning of the year.

The quoted German steel export prices are: Steel bars, $62 to $63 per metric ton; structurals $63 to $64; heavy plates $72 to $73; wire rods $70 to $72; ship plate $80 to $82; galvanized wire $110; wire nails $90. A general increase in steel prices may come shortly.

Ceiling prices for tin were abolished last May, and controls on copper, lead and zinc will disappear soon. Germany has even started to export nonferrous metals to the U. S.; 677 tons of lead, 7326 tons of aluminum and 1501 tons of copper were shipped recently.

High German production is being jeopardized by the threat of widespread strikes. The unions have a demand of "codetermination" whereby they want representation on all boards of directors in all corporations. They want half the seats, to be held by appointees named by the central union, not the local group. Employers, of course, won't accept that arrangement.

France Supports Freer Trade

The French government is giving more support to a free trade policy. The liberalized attitude has thus far borne fruit chiefly in soft currency countries.

Trade with the U. S. has increased because of scare buying. The French steel industry is straining to produce every possible ton of ingot and is now turning the metal out at the rate of about 800,000 tons a month.

French metalworking companies are turning more to arms manufacture.

The Saar Cashes in

The Saar, now closely tied in with the French economy, is cashing in on the industrial boom in Western Europe. Devastated during World II and hard hit by the mild European recession of 1949 and early 1950, the area is now reviving and this year may surpass the record prewar year of 1938. That year output was 14.4 million net tons of coal, 2.6 million tons of pig iron, 2.8 million tons of ingot steel and 2.3 million tons of rolled steel products.

At the outbreak of the war, the Saar iron and steel industry consisted

Wide World

SHARP UPTURN: A woman worker feeds finished razor blades into a packing machine at a razor blade factory in Solingen, Germany, heart of the country's cutlery industry now experiencing a revival. The roll in the foreground bears the wax paper that is used to wrap individual blades

of 29 blast furnaces with another under construction, 6 batteries of coke ovens, 20 basic steel furnaces, 16 acid furnaces, 7 blooming mills and 42 rolling mills of different types. The coal industry had 18 mines. All the works today are controlled by French companies or by Luxemburg firms in which the French have a substantial interest.

Eighteen of the 30 blast furnaces are now in operation. Three wire mills, two tube mills and a plant making cold-rolled bands are operating. The territory has some 60 other plants to fabricate machinery and structural steel. All 18 of the coal mines are back in production. The area has an estimated 9 billion tons of coal in reserve.

The revival of the Saar industries has given work to 158,575 people. The coal mines alone give work to 67,118, and the iron and steel works employ 28,200. Two labor unions are prominent, the Social Democratic Syndicate and the Christian Popular Syndicate. About 8 per cent of the population is Communist and they have only two representatives in the Saar parliament of 50 deputies. No strikes have occurred in the territory since it was economically joined to France.

U.K. Tractor Seeks U.S. Markets

Britain will enter world markets soon with its first heavy track-type tractor for industrial and earth moving work to compete with American machines. Nearly $3 million has been spent already on developments. Full production will begin in January, 1952, with an output of about 500 a year.

The 15-ton unit will be assembled by Vickers-Armstrong Ltd. and will use a Rolls-Royce diesel engine of about 180 hp.

British steel exports continue to climb. In the first five months of this year, they totaled 1,341,660 net tons, compared with 1,089,863 tons in the same period last year.

The Union of South Africa, Australia and Iran are the three best customers for British steel. Australia has doubled her purchases in the last 12 months. Canada's buying in Britain is expected to increase because of the tight supply situation in the U. S.

Total steel output in Great Britain in the first half was 9,306,000 tons, an alltime high. The second-half production is not likely to be quite so high because of vacations in July and August. Domestic steel supplies are as tight as ever; sheets are particularly difficult to get.

Stampers Talk Mobilization

The problems they'll be up against will be discussed at their annual meeting

DEMANDS made on metal stampers in a period of mobilization will be one of the major topics discussed at the annual meeting of the Pressed Metal Institute, national association of metal stampers, Sept. 11-17. The convention will leave Montreal for a boat trip up the St. Lawrence and Saguenay rivers and will make a three-day stopover at Hotel Tadoussac where the two rivers meet in Quebec.

There will be no speakers and no speeches at the convention. Instead a continuous series of committee meetings on the boat and at the hotel has been planned. Each will be concerned with problems resulting from current national and international conditions.

Emphasis will be placed on the completion of plans for mobilizing the facilities of the industry and for establishing basic manpower requirements and training schedules. PMI member companies from more than a dozen states and all of the big stamping centers will attend the meeting. Companies in the stamping industry that are interested are invited to make reservations for the meeting.

Woodard G. Jeschke, president of Res Mfg. Co., Milwaukee, as president of PMI, will preside at the annual membership meeting. Among committee chairmen who will direct planning sessions are: Howard Wolf, assistant to the president of Mullins Mfg. Co., Salem, O., chairman of the Industry Mobilization Committee; Raymond Peterson, Peterson Engineering Co., Toledo, O., chairman of Technical Research and Standards Committee; Ralph Boyll, director of labor relations, National Stamping Co., Detroit, chairman of Industrial Relations Committee; and Wilfred Williams, sales manager, Acklin Stamping Co., Toledo, chairman of Education Committee.

Further details of the meeting may be had from PMI, 13210 Shaker Square, Cleveland 20.

Blame It on Stalin

THE 1950 Metal Show, to be held in Chicago Oct. 23-27, is shifting gears because of the Korean war. Instead of emphasizing economies in production as originally planned, the show will emphasize plans, materials and equipment for high production.

The congress and exposition is sponsored by American Society for Metals. The congress, covering the technical developments in metals, both ferrous and nonferrous, will be held in scores of meetings, lectures, forums and seminars in Chicago hotels. The International Amphitheatre will be the scene of the exposition, devoted to more than 350 operating and nonoperating displays of materials, processes, equipment and services.

Brown's Instrumentation Course

Starting today, an industrial instrumentation training seminar for faculty members of engineering colleges and schools will be held for two weeks at the Brown Instruments School in Philadelphia.

The school has been conducted by Brown Instruments Division of Minneapolis-Honeywell Regulator Co. for the past 14 years. In that period the school instructed hundreds of industrial plant personnel from the U. S. and many foreign countries. In the last war all branches of the armed services sent officers and enlisted men to the school for special courses.

Gray Iron Safety Booklet Out

"How You Can Work Safely" is the title of a safety booklet just published by the Gray Iron Founders' Society, gray iron industry's trade association. The illustrated 14-page booklet is printed in two colors. It is intended for distribution to employees in any gray iron foundry regardless of its working conditions.

The booklet was prepared by a committee of gray iron safety experts, chairmanned by George A. Riley, supervisor of safety for American Brake Shoe Co., New York. The regular price is 20 cents per copy; a moderate charge is added to cover imprinting. Publication of the booklet is the first step in a broad safety program started by the society. Its offices are in Cleveland.

AISI Sets Regional Meetings

American Iron & Steel Institute has scheduled four regional meetings for this fall: Oct. 11, William Penn Hotel, Pittsburgh; Oct. 27, Thomas Jefferson Hotel, Birmingham, Ala.; Nov. 10, Mark Hopkins Hotel, San Francisco; and Dec. 1, Drake Hotel, Chicago.

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GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • ECORSE, DETROIT 29, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Eight Detroit foundries are involved in a scuffle with the government and the courts over an antitrust suit. Foundrymen say tough competition brings similar prices

DETROIT

A LIVELY scuffle developed here in connection with the antitrust suit brought by the government against eight local foundries which furnish the bulk of the large castings required for automotive stamping dies.

The plants were accused of price fixing through operation of a local trade association and their officials had entered a plea of nolo contendere (unwilling to contest). The federal judge levied fines against the companies and their officials totaling around $49,000, whereupon the attorney for the companies released a statement pointing out that his clients had entered their plea with reluctance, wishing to avoid a trial which might have run three to five weeks and costing $75,000.

The Heavy Touch—The statement added that "if the government saw fit to commence proceedings on the purely economic problems of the industry, the civil and injunction procedures were available, rather than the ridiculous criminal action that has been used. Assuming that the industry has any practices requiring correction, the Justice Department's young men have used a hacksaw instead of a scalpel. . . . Certainly there has been no price fixing in an industry of which we constitute less than 1 per cent of national output."

With this, the judge hit the ceiling and ordered the clerk of the court to refuse to accept any fines. He declared, "Lawyers can't come into my court and plead nolo contendere and then issue statements to the papers saying their clients are not guilty."

Head of the Justice Department's antitrust division said that unless the defendants publicly retracted their statement, he would ask the judge to set aside the pleas. The foundrymen disclaimed any willful collusion on prices but added that their business is "so highly competitive through customer pressure that the claimed similarity of prices is the result of vigorous competition."

Peace finally reigned when the foundrymen's attorney withdrew his statement and the judge relented to permit payments of the fines.

Rugged Business—Casting of large automotive dies, in addition to being a highly competitive business, is a highly seasonal one, and the foundries in the field often have a pretty rugged time of it because of long periods of idleness between new model programs. There is some machinery work to fill in, but here again the scramble for available casting business is intense. Some of the big stamping dies will run to as much as 20 or 30 tons in weight.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	732,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July		604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
July 15	194,073	156,436
July 22	187,339	160,173
July 29	194,828	138,727
Aug. 5	194,828	138,727

Estimates by Ward's Automotive Reports

Ford Expands Personnel Program

Ford is extending its management development program to provide for most of its future managerial needs from its own personnel. The new program is the final step in an overall plan which in addition to providing opportunities for greater promotion within the company, will establish analyses and specifications for every job in the company and provide planned training programs to enable employees to improve in their present jobs and qualify for better ones.

Chance for Advancement—The extended program will do three things: Assist management personnel in attaining maximum effectiveness in their present positions; provide adequate reserves of management personnel by developing qualified men for management positions; and make the best possible use of each member of management in terms of his ability, qualifications and potential.

Previously the company had established pre-foreman training, foreman training and production management training programs, in addition to apprenticeship programs in the manufacturing fields. The new program will provide further training in the production field, beyond the present superintendent level, and in nonproduction staff operations. It will be started in the Lincoln-Mercury Division and the central staff finance office, then extended to other operations.

Top-Brass Committee—A management development committee will direct the program, including Henry Ford II, E. R. Breech, executive vice president, and John S. Bugas, vice president-industrial relations, who will be company-wide co-ordinator. Also on the directing group will be Messrs. Benson Ford, I. A. Duffy, vice president-purchasing, Del S. Harder, vice president-manufacturing, H. T. Youngren, vice president-engineering, and T. O. Yntema, vice president-finance.

In setting up the program, the first step will be to make detailed position descriptions of every management job. These position descriptions will show responsibilities, number and types of personnel supervised, necessary technical operations, types of decisions to be made, contacts in and out of the company, and correlated descriptions of the required personal qualifications, including training, education and experience.

How Are You Doing?—The second step will be an individual appraisal of the performance of all management personnel. This will cover knowledge of present work, analytical ability, judgment, initiative, development of personnel and other factors. Complete management personnel inventories then will be prepared for each operation of the company. They will provide information on present and future managerial ability available, and will show where further development of individuals may be necessary. The final step in the program will be to establish individual development plans for all management personnel.

Ford is already providing em-

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ployees with 40,000 hours of classroom instruction a month and another 150,000 hours of on-the-job training. The new management program will increase these totals substantially.

Transmission Refinements Mount

In the manufacturing of automatic transmissions there is probably more continuous refinement of design and improvement of processing techniques than in any other single phase of metalworking. The explanation is twofold: First, the unrelenting pressure on costs; and second, the fact that the devices are relatively new and subject to many improvements which did not appear obvious while still in the blueprint stage.

Thus in one type of automatic transmission, in production for about a year, there have been 47 engineering changes and they are still coming through. Simple little things like a new method for stamping flat steel washers to avoid the necessity for grinding their faces will save a few cents here and a few there, with the end result that unit costs are constantly moving down. At the same time the capital investment required for machinery and tools is exceeding original estimates, in many cases. If, for example, a new type of gear shaving unit is developed which, with two machines, will handle the work formerly done by four, then the old machines simply have to go out and the new ones be purchased.

Packard in Red for First Half

Advanced absorption of new model costs and additional tooling and manufacturing expense chargeable to its automatic transmission were major factors in a loss of $736,682 in the first half of the year for Packard. The loss is after estimated income tax carryback, and compared with net income of nearly $4.8 million in the like period a year ago.

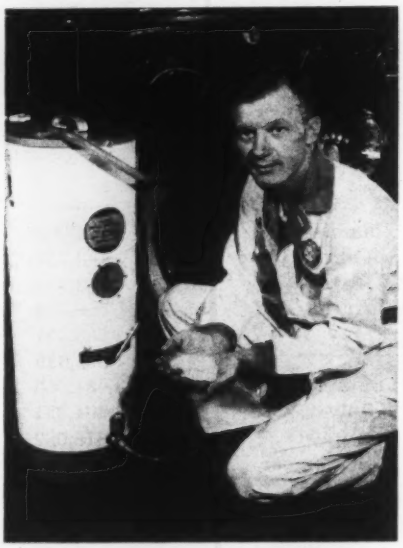
In his half-year financial report, Hugh J. Ferry, president, points out that it requires considerable time to perfect and manufacture in quantity a device as entirely new as the Ultramatic transmission and thus, had the company not been limited in production of the unit, or had it deferred absorbing a considerable portion of tooling and engineering expense for both the transmission and the new models now on the assembly line, the company would have been in the black for the first six months.

Profitable operations are expected by the fourth quarter, barring government restrictions or other developments beyond the company's control. Working capital at the end of June was well over $43 million, compared with $44.6 million at the end of March.

New Way To Get Rid of Carbon

A new idea in automotive service equipment has been perfected by the engineering and service departments of Oldsmobile, providing a quick and inexpensive method of removing carbon deposits from combustion chambers without taking off the cylinder head of the engine.

The machine, known as the "head-on" carbon blaster, utilizes rice under air pressure to scour combustion chambers through the spark plug openings. In operation 10-20 pounds of specially prepared rice is poured into the perforated hopper of the blaster. The mechanic inserts the nozzle in the spark plug port and turns a control valve to admit air to the machine. He works the nozzle tip up and down in the chamber, rotating it to blast all areas. The rice under pressure chips off carbon deposits and cleans all of the surfaces thoroughly.



HEAD-ON CARBON BLASTER
. . . it cleans with rice

A good cleaning takes about 4½ minutes for each chamber, about 75 per cent less time than with conventional hand cleaning after removal of the cylinder head. About ½-pound of rice is consumed in the cleaning.

The machine itself is cylindrical in shape, stands about 40 inches high and is 18 inches in diameter. It has two plastic hose lines which connect with the nozzle, one for forcing the rice into the combustion chambers and the other for drawing it out. A glass window permits the operator to observe the rice level.

In preparing an engine for cleaning, it first must be turned over so the piston is 12 degrees past top dead center and both intake and exhaust valves closed. Engine timing is set at zero. Then the distributor cap is removed and replaced with a special cylinder indicator gage. The cylinder firing order is marked on this gage and calibrated so that by rotating the engine until the distributor rotor is in line with a number on the indicator the piston of that particular cylinder is automatically placed 12 degrees past top center.

In a V-type engine, each bank of cylinders is cleaned in order. Wires are removed from spark plugs and the plugs loosened so the engine will turn over easily. Wedge-type rubber blocks are placed between the fan belt and fan pulley on both sides of the pulley to prevent the piston from being forced down by air pressure. Pressure of 40-60 pounds is used.

Conversion Will Take Time

Chrysler Corp. President K. T. Keller says industry's ability to achieve a full wartime production schedule is being overestimated.

Industry must be geared to new weapons, he says, and that takes time. New model tanks and jet engines require special steels and special machine tools.

Mr. Keller reports that work in Chrysler plants has been stepped up on a $25 million order for combat vehicles placed before the Korean war began, but that no additional orders for war equipment had been placed up to July 26 with Chrysler.

U.S. Rubber To Open GR-S Plant

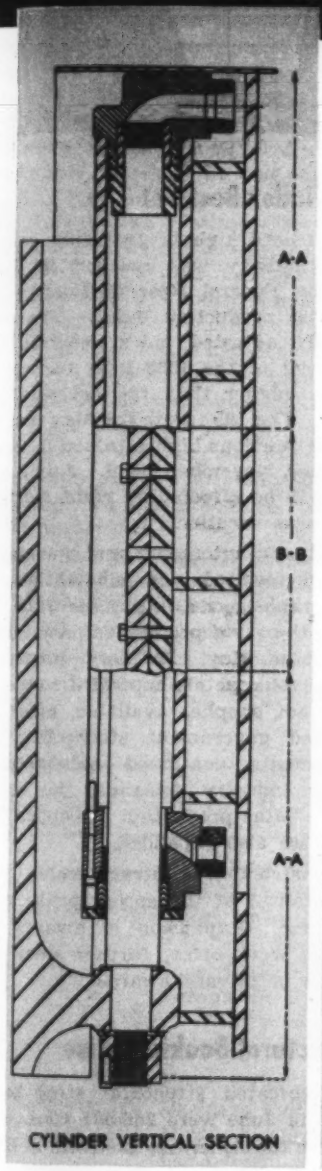
United States Rubber Co., New York, will begin work at once to reactivate the GR-S synthetic rubber plant at Port Neches, Tex., as requested by Reconstruction Finance Corp. The plant should be in operation in about three months.

One of the first jobs will be to reassemble equipment that was dismantled and put in standby condition when the plant was closed down after the big war. The Port Neches plant has a rated capacity of 60,000 tons. John P. Coe, vice president and general manager of the company's Naugatuck chemical division, says it will be possible to increase the Neches plant capacity to 75,000 tons if necessary.

U. S. Rubber is operating a government-owned synthetic plant at Naugatuck, Conn., with a capacity of 30,000 tons, and a plant at Borger, Tex., with a capacity of 45,000 tons.

What engineering features are responsible for LAPOINTE LEADERSHIP in building BROACHING MACHINES?

HERE'S A LIFETIME CYLINDER!



CYLINDER VERTICAL SECTION

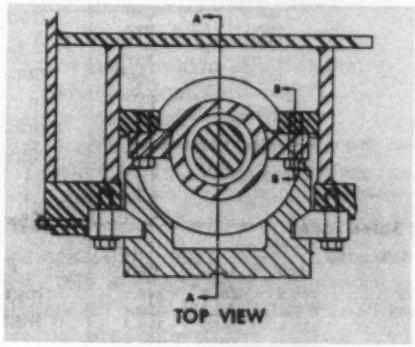
TAKE A LOOK at this drawing and see for yourself what Lapointe engineering has accomplished, in building genuine two-fisted *ruggedness* into the cylinder of a vertical broaching machine.

The cylinder is made in *one* welded steel construction with side ears extending the full length. These are bolted to corresponding ears extending also the full length, and rigidly bolted and doweled to the frame — forming an amazingly strong shallow U-section. Naturally, *it cannot spring — and it maintains constant fit on the slide.*

THE CAST IRON PISTON has diesel engine-type piston rings. The rod is carburized hardened and ground to a fine finish, guided into bronze bushings and a standard packing gland.

Cylinder caps are both fitted with O-ring seals for permanency.

This construction permits ZERO-MAINTENANCE on the cylinder!



TOP VIEW

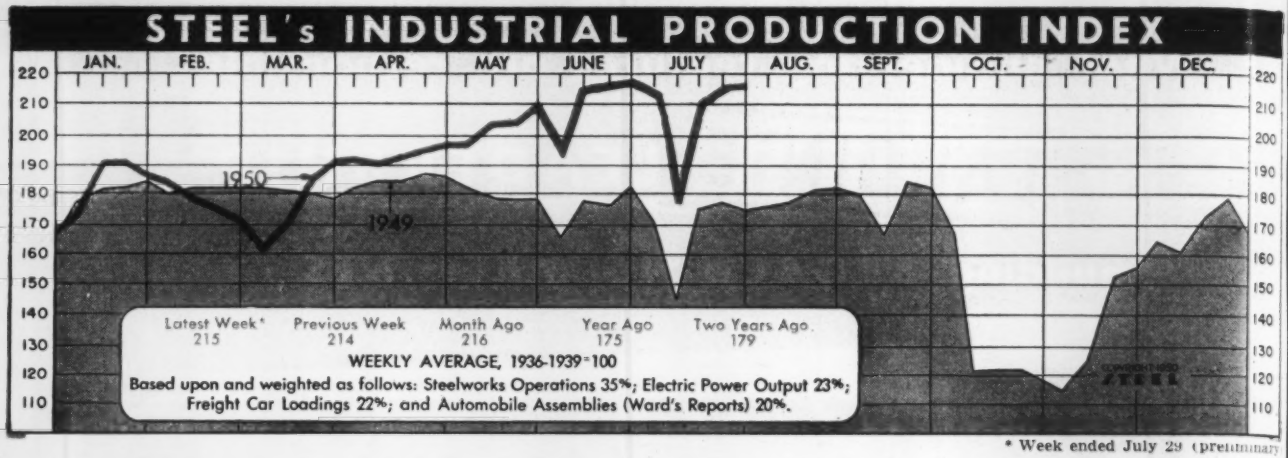
COMPLETE ENGINEERING DATA

and dimensions on double ram and single ram LAPOINTE Vertical Broaching Machines will be found in these two illustrated bulletins. You are invited to send for Bulletins DRV-3 and SRV-3.

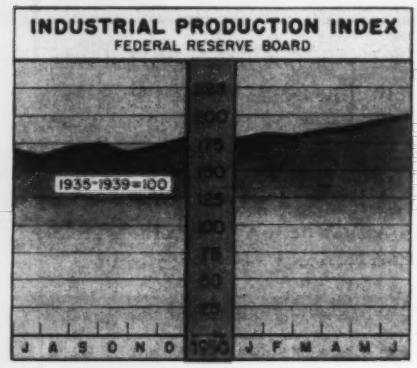
LAPOINTE Vertical Broaching Machines are all built to JIC Standards at no extra cost.

LAPOINTE takes the responsibility for the entire job — machines, tools, and fixtures. That's a big reason for Lapointe Leadership . . . that's why "Lapointe's the way to *better broaching!*"

THE Lapointe MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.
Branch Factory • Edgware • Middlesex • England
THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHES AND BROACHING MACHINES


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1950
1949
Latest Week* 215
Previous Week 214
Month Ago 216
Year Ago 175
Two Years Ago 179
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

* Week ended July 29 (preliminary



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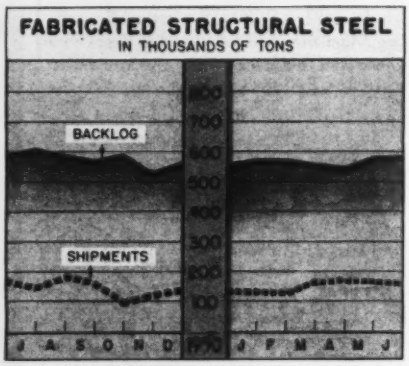
Industrial Production Indexes

	Total Production		Iron, Steel		Non-ferrous	
	1950	1949	1950	1949	1950	1949
Jan.	183	191	203	228	179	184
Feb.	181	189	201	232	188	185
Mar.	187	184	205	233	199	183
Apr.	190	179	222	219	196	168
May	195	174	226	204	195	145
June	199	169	229	177	202	132
July	....	162	...	156	...	128
Aug.	....	170	...	178	...	141
Sept.	....	174	...	179	...	157
Oct.	....	166	...	103	...	164
Nov.	....	173	...	144	...	163
Dec.	....	180	...	198	...	165
Avg.	....	176	...	187	...	160

Federal Reserve Board

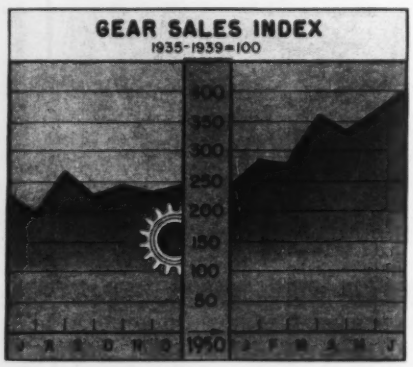


Fabricated Structural Steel

Thousands of Net Tons

	Shipments		Backlog	
	1950	1949	1950	1949
Jan.	135.2	152.7	565	675
Feb.	129.6	145.9	565	683
Mar.	156.8	185.9	556	582
Apr.	163.2	179.2	540	628
May	165.9	171.1	578	599
June	162.3	172.3	580	583
July	....	148.0	...	605
Aug.	....	183.9	...	583
Sept.	....	162.1	...	562
Oct.	....	99.8	...	584
Nov.	....	117.2	...	527
Dec.	....	135.5	...	555
Total	....	1,853.5	...	...

American Institute of Steel Construction



Gear Sales Index

1935—1939=100

	1950	1949	1948
January	280.2	320.7	346.8
February	272.9	282.3	324.4
March	358.4	299.1	389.8
April	328.6	339.0	320.9
May	363.1	250.1	283.6
June	401.0	227.8	324.1
July	....	193.1	384.4
August	....	262.0	335.6
September	....	224.9	320.4
October	....	242.3	333.3
November	....	230.7	309.0
December	....	242.8	325.9

American Gear Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction July24	Machine Tools July31	Refrigerators July31
Durable Goods July24	Malleable Cast. July24	Steel Cast. July24
Employ., Metalwkg.June19	Price Indexes July31	Steel Shipments ...July24
Employ, Steel July24	Pump Orders July17	Trucks, Elec. Ind...Jan.2
Freight Cars July17	Purchasing Power..July31	Vacuum Cleaners ..July31
Furnaces, Indus. ...July17	Radio, TV July17	Wages, Metalwkg...June19
Furnaces, W. Air..May8	Ranges, Elec. July31	Washers July10
Ironers July17	Ranges, Gas. July10	Water Heaters July10

FRB Index Best Yet

A record high in peacetime industrial activity was reached in June by the Federal Reserve Board's industrial production index. The seasonally adjusted index reached 199 per cent of the 1935-1939 average, 4 points higher than the revised May total. The 195 figure for May matches the previous high attained in October and November, 1948. July's figure will be affected by plant closings for mass vacations.

Gains in automobile and machinery output resulted in a substantial rise in durable goods output for June despite the rapid productive pace maintained in May. Refinery output of nonferrous metals expanded considerably but supplies available, after increased government stockpiling requirements continued substantially below industry demands, the board says. Mine production of copper and iron ore also expanded.

Construction contract value was maintained at the spring peak value in June. Expansion in awards for public work offset further small declines in private awards.

Structural Bookings Rise

Fabricated structural steel bookings in June were 266,531 tons, estimates the American Institute of Steel Construction. It was the highest booking month since April, 1942, when 313,953 tons were recorded for the industry. Total bookings in the first half were 1,036,001 tons, 48 per cent greater than in the same period a year ago and 8 per cent above 1948's first half.

Shipments in June were 162,343 tons and brought the first half total to 913,166 tons, 6 per cent less than in the first half a year ago. Increased pressure to get work under way before steel supplies get tighter would mean a good shipments volume for the next few months at least.

The Business Trend

Industry steps up production pace from mid-summer slump in effort to fill heavy consumer demand swollen further by war-scare buying

WAR-SCARE civilian business superimposed on the already high level of demand is driving the nation's industrial activity at breakneck pace.

Reflecting this gait, STEEL's industrial production index for the week ended July 29 edged up one point to 215 per cent of the 1936-1939 average. This marks continued recovery from the drop occasioned by the mid-summer holiday and mass vacation period in July. The index is now only four points below the alltime high of 219 set in the week ended June 24.

Very little of the brisk industrial activity can be attributed to building of war material. Except for airplanes the government has not determined how much more of what it must order to strengthen the nation's military machine.

Even had the Korean fracas not arisen the industrial production level in the United States would have continued its fast tempo, for manufacturers' new orders in June reached a new monthly high for the year, $22.6 billion. This is $2.3 billion over May. Little of this increase is inspired by the situation in Korea, because the United States did not enter the military conflict there until July 1.

The rise in manufacturers' new orders in June was more marked in the durable goods industries than in those producing nondurables. New orders received by makers of durable goods totaled $10.8 billion in June, compared with $8.9 billion in May. Producers of nondurable goods received $11.7 billion worth of new orders in June, compared with $11.4 billion worth in May. Sharpest increases in new orders received were in the aircraft and iron and steel industries.

Spurred by high demand from consumers, manufacturers "gave their all" to production, with a result that production slightly exceeded the volume moved to consumers. Consequently, the book value of manufacturers' inventories made a further slight rise to $31.8 billion at the end of June. This is in contrast to the usual seasonal decline in inventories during that month.

Manufacturers' production in June totaled $20.7 billion, compared with $19.9 billion in May.

Surge in Sales . . .

Reflecting the upsurge in consumer buying and hoarding since the Korean conflict broke out, department stores' dollar volume of business in the week ended July 22 rose 46 per cent over the corresponding week last year. Although substantial increases had been recorded in each of the weeks of July the jump in the week ended July 22 was the most pronounced one. By the end of the month the wave of war-scare buying was reported to be subsiding.

Steel Output Rises . . .

Relentless demand for steel pushed production of steel for ingots and castings up one point to 100.5 per cent of capacity in the week ended July 29. This represents recovery to within one point of the year's high

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	99.5	99.0	101.5	81.0
	Electric Power Distributed (million kilowatt hours)	6,190	6,186	6,115	5,518
	Bituminous Coal Production (daily av.—1000 tons)	1,867	1,550	1,740	1,213
	Petroleum Production (daily av.—1000 bbl.)	5,522	5,537	5,435	4,731
	Construction Volume (ENR—Unit $1,000,000)	$252.5	$343.3	$287.6	$131.8
	Automobile and Truck Output (Ward's—number units)	194,828	187,339	196,767	138,727
	*Dates on request. † 1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	820†	830	783	724
	Business Failures (Dun & Bradstreet, number)	160	170	156	168
	Money in Circulation (in millions of dollars)‡	$26,915	$27,029	$27,026	$27,333
	Department Store Sales (changes from like wk. a yr. ago)‡	+46%	+25%	+1%	−10%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,198	$15,096	$14,456	$12,701
	Federal Gross Debt (billions)	$257.4	$257.2	$256.5	$253.2
	Bond Volume, NYSE (millions)	$33.7	$28.9	$31.5	$13.1
	Stocks Sales, NYSE (thousands of shares)	11,876	11,744	17,099	4,617
	Loans and Investments (billions)†	$67.9	$67.6	$67.9	$63.3
	United States Gov't. Obligations Held (millions)†	$36,222	$36,248	$36,935	$35,507
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.69	156.69	156.69	152.80
	STEEL's Nonferrous Metal Price Index‡	194.2	192.1	183.5	178.3
	All Commodities†	163.7	163.3	157.1	153.0
	Metals and Metal Products†	173.5	173.3	173.1	168.0
	† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. †† 1935-1939=100.				

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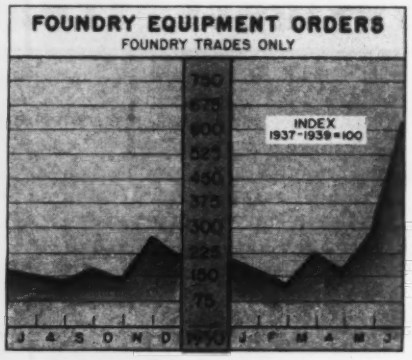
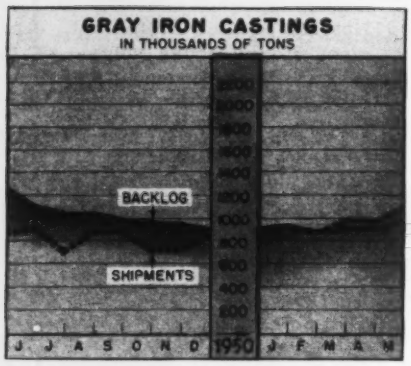


Foundry Equipment Orders

	Index 1950	Index 1949	Value in Thousands 1950	Value in Thousands 1949
Jan.	159.3	149.9	$731	$694
Feb.	113.1	144.4	519	668
Mar.	225.2	190.8	1,034	883
Apr.	160.6	172.0	737	797
May	294.9	121.9	1,353	565
June	622.7	164.9	2,858	764
July	....	146.6	....	679
Aug.	....	127.1	....	589
Sept.	....	166.6	....	772
Oct.	....	133.5	....	618
Nov.	....	270.4	....	1,250
Dec.	....	201.0	....	929

Foundry Equipment Mfrs. Assoc.

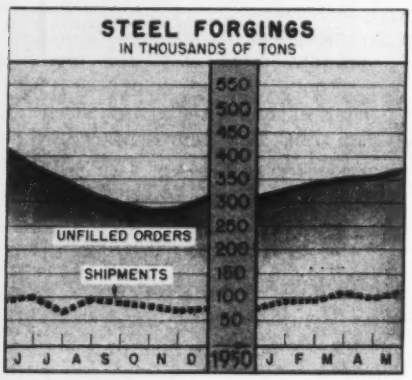


Gray Iron Castings

Thousands of Net Tons

	Shipments 1950	Shipments 1949	Backlogs* 1950	Backlogs* 1949
Jan.	913	1,040	914	2,065
Feb.	864	987	873	1,857
Mar.	996	1,075	922	1,639
Apr.	981	929	922	1,446
May	1,095	867	978	1,243
June	...	906	...	1,087
July	...	697	...	1,032
Aug.	...	872	...	1,048
Sept.	...	881	...	980
Oct.	...	716	...	955
Nov.	...	719	...	939
Dec.	...	862	...	892
Total	...	10,551		

*For Sale. Bureau of the Census



Steel Forgings

Thousands of Tons

	Shipments 1950	Shipments 1949	Unfilled Orders* 1950	Unfilled Orders* 1949
Jan.	93	124	327	571
Feb.	93	111	341	540
Mar.	109	120	350	503
Apr.	99	104	357	465
May	114	92	373	412
June	..	101	...	377
July	..	70	...	348
Aug.	..	96	...	312
Sept.	..	88	...	294
Oct.	..	81	...	280
Nov.	..	73	...	287
Dec.	..	78	...	308

* For Sale. Bureau of the Census.

Charts—Copyright, 1950, STEEL

Foundry Equipment Surge

Large orders by Ford and healthier climate for entire industry push buying to high

LIKE a flash flood rising in a dry western river bed foundry equipment orders roared to a three-year high in June. The Foundry Equipment Manufacturers Association's new orders index climbed almost vertically to 622.7 per cent of the 1937-1939 average, highest point since June, 1947. In dollar volume June orders totaled $2,857,514, compared with $1,353,284 a month earlier.

Ford in Their Future — Orders placed for the new Ford foundry in a Cleveland suburb pushed the index up to its latest peak. Not all the orders for the $30 million plant are in yet and additional buying will be a big help to the foundry equipment makers in months to come.

The effect of Ford's heavy buying in the June figures is very important, but there was improvement in other quarters. With the foundries doing much better than they were a year ago, there is much improvement in what is considered the normal run of business.

After the Show—Orders usually spurt after the Foundry Show and this year the pattern was followed. Foundries hold off on their buying until they have a chance to see the newest items unveiled at the show. May's index was 294.9, a gain of 134 points over April and the best mark in a year and a half. So the June figure jumped from an already high level.

Like all capital goods manufacturers, foundry equipment makers are feeling effects of industry trying to get its productive facilities into top-notch shape. When defense orders finally start coming through there will be a spurt in buying to handle that work. Even the most optimistic don't expect orders to reach the 1942 level when the index averaged 705.4 for the year, at least not with partial mobilization.

Shipments of course react more slowly to a buying spurt. June shipments of new equipment and repair parts were the highest since the same month last year, totaling $1,682,407. The industry has come a long way since the postwar low in both orders and shipments was reached last February.

mark set and maintained in the six weeks before the July holiday and mass vacation period reduced output. Very little of the present demand for steel stems from military requirements.

More Autos . . .

The automobile industry hiked its output to 194,828 passenger cars and trucks in the week ended July 29 but would have gone higher had there been sufficient materials and no labor difficulties. In the preceding week production had been 187,339 units.

Higher Prices . . .

War-scare buying on top of the existing heavy demand for most all products continued to push the wholesale commodity price index upward. In the week ended July 25 it reached 163.7 per cent of the 1926 average, the U. S. Bureau of Labor Statistics reports. This is a rise of 4.2 per cent over four weeks ago and 7 per cent above the comparable week a year ago.

Record Breaker . . .

High rate of industrial production plus increased use of electricity for summer cooling and for farm and home tasks pushed the weekly output of electricity to a new alltime high, 6,190,098,000 kilowatt hours, in the week ended July 29. The previous high had been set by 6,185,702,000 kwhr distributed in the week ended July 22.

Gradual Diversion in Building

Diversion of peacetime construction volume to war requirements will be made gradually during the re-

mainder of this year and probably will not affect more than 25 per cent of the total, says W. E. Waste, vice president of Bechtel Corp., builder specializing in heavy construction.

Mr. Waste estimates a minimum of 10 per cent of construction volume will be shifted to the wartime category within 90 days and by the end of this year the shift may amount to 25 per cent.

Most of this shift will come from a reduction in commercial construction, but very little heavy industrial building will be affected, Mr. Waste believes.

He also believes that an increase in construction for defense activity will more than offset any reductions in peace time building.

TV Boom Aids Sylvania

Soaring demand for television and its component parts accounts for Sylvania Electric Products Inc.'s sales totaling $61,086,101 in the first half, 23 per cent higher than a year ago. Sales in the second quarter which were 40 per cent higher than in the like 1949 period amounted to more than $31.7 million. June was the largest month of the year for Sylvania.

Chicago Area Buzzing

For the first seven months of 1950 the investment programs in the Chicago area were greater than the 12-month total for any year since 1942. Plans for building new plants and plant additions and for getting industrial plants and buildings amounted to $192,466,000.

Three of the companies entered business in the Chicago area for the first time last month: Admiral Die Casting Co. is building a one-story factory of 21,000 square feet for production of aluminum castings. General Detroit Corp., Detroit, fire extinguisher equipment manufacturer, bought a building of 30,000 square feet to be operated as a branch plant. And Lincoln Smelting & Refining Co. leased a building for resmelting and reclaiming nonferrous metals.

Cleveland Graphite Keeps Busy

Cleveland Graphite Bronze Co.'s employment is up 30 per cent since the first of the year and production is being stepped up at branch plants in Bridgeport, O., and Ft. Wayne, Ind.

The main Cleveland plant is working three shifts six days a week in nearly every department and will continue some production during the vacation period.

This healthy state of affairs is partly due to Cleveland Graphite's automotive items being in heavy demand but business outside the motor car industry also is enlarged. Orders and inquiries indicate high volume in the second half.

Bus Business Better

Spurt in ordering by transit companies brightens outlook for motor coach makers

THE BUS MAKERS' "holiday" is over, they hope.

On the basis of new orders placed in the last few weeks it would appear they will not be disappointed.

Outstanding among the orders is the one the Chicago Transit Authority placed last week with Twin Coach Co., Kent, O. The order, for 500 51-passenger propane-fueled busses, is believed by Twin Coach to be the largest one ever placed by a transit system.

In addition to that order Twin Coach received orders from Omaha, Nebr., for 125 busses and from San Antonio, Tex., for 15. All are to be propane fueled. Other recent purchasers of propane-fueled Twins include Wichita, Kans., Ft. Wayne, Ind., and Los Angeles.

Looking Up—In issuing its mid-year report last week White Motor Co., Cleveland, said firm orders it has for busses indicate an improvement for the last half of this year. The company's bus manufacturing operations in the first half were at a very low level. This was true for the bus manufacturing industry as a whole. In February, low point of the year, the industry built only 133 motor coaches (see accompanying chart). There has been uninterrupted recovery since then, although the total for the first six months was only 1837, compared with 3331 in the corresponding period of 1949.

Helping brighten the bus outlook at White is an order from Bogota, Colombia, for 80 busses costing $1,453,000.

Coach building by General Motors Corp.'s Truck & Coach Division was bolstered last month by orders for 175 large capacity diesel-powered transit units for Chicago and Los Angeles. In the July 1 to 25 period, this division built 152 coaches, consisting of 123 transit and 29 parlor units.

Large scale output of busses by Mack Trucks Inc., New York, was in prospect. Actual construction on two orders from New York city, one for 200 units of the 45-passenger variety and another for 400 in the 50-passenger category, was expected to begin in early September, and a requisition for 100 busses for Jacksonville, Fla., is a late year prospect.

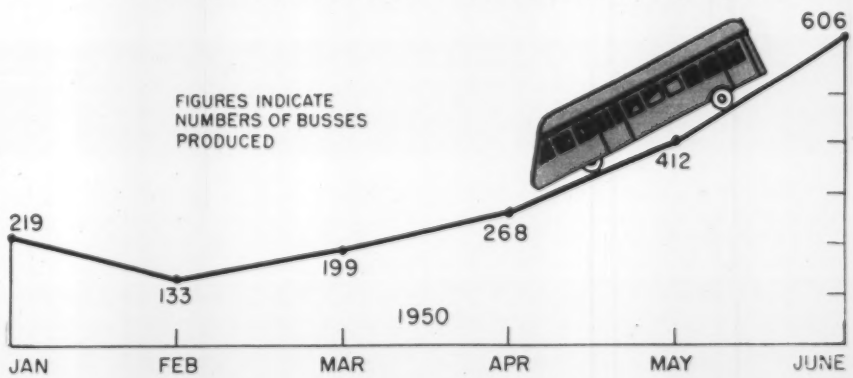
Victory for Propane—The 500-bus order Twin Coach received from the Chicago Transit Authority is valued at $8,117,500. Price of each bus was $16,235. The order, says L. J. Fageol, president of Twin Coach, marks the first large entry of high octane propane-powered vehicles into the urban transit industry; it heralds replacement of gasoline and diesel-fueled busses by propane-powered vehicles, he believes.

Propane, a by-product of the petroleum industry, costs approximately half as much as gasoline and from 10 to 40 per cent less than diesel fuel. Other advantages claimed for propane-powered busses are 50 per cent increased time between engine overhauls, easier starting, faster acceleration, improved engine performance and elimination of obnoxious exhaust odors and smoke.

While Mr. Fageol gives large credit to the propane feature of the Twin Coach busses for capturing the Chicago Transit Authority's order for the 500 busses it is reported the international situation and increased fares have increased interest among transit companies to make equipment replacements.

Bus Makers' Holiday May Be Over

. . . new ordering may keep this production curve going up



Men of Industry

C. WARNER McVICAR
. . . asst. V. P.-purchasing at Rockwell

C. Warner McVicar was appointed assistant vice president of purchasing activities of the various subsidiaries and divisions of **Rockwell Mfg. Co.**, Pittsburgh. With many years' experience in administrational and organizational phases of purchasing, Mr. McVicar in 1945 was consultant for the War Assets Administration, and later was assistant to the president and director of purchases for Brezner Tanning Corp., and senior buyer for Ford Motor Co.

Braeburn Alloy Steel Corp., Braeburn, Pa., appointed **Kenneth A. Stroble** as general sales manager. **Frank T. Klock** succeeds Mr. Stroble as western New England sales manager.

John R. Casey was appointed manager of the newly established gas turbine sales division of **General Electric Co.'s** apparatus department's turbine divisions, with headquarters in Schenectady, N. Y. He has been a turbine specialist in the Philadelphia office. **Charles C. Leader** was named staff assistant to the manager of engineering, large apparatus divisions. **B. W. Mahoney** was appointed assistant manager of sales and **Max I. Alimansky,** assistant manager of engineering, was named to succeed Mr. Mahoney as assistant manager of manufacturing for the transformer and allied product divisions.

R. T. Adams, sales representative for **Lima-Hamilton Corp.** in Chicago, succeeds **Roland H. Johnson,** resigned, as sales manager, Hamilton-Kruse line of can-making machinery. He will have his offices in Chicago. Mr. Johnson has joined the Standard Knapp Division, Hartford Empire Co.

JOEL B. GIBSON
. . . assists president at SSIRCO

Joel B. Gibson was promoted to assistant to the president of **Southern States Iron Roofing Co.,** Savannah, Ga. He was chief engineer. In this newly created position Mr. Gibson will be actively concerned with an anticipated expansion program of the company and in development of new products. He also will work with the president in co-ordinating the efforts of Southern States and Reynolds Metals Co. to promote distribution of aluminum building products in the South.

Appointment of **J. Nall Candler** as administrative assistant to the president and general manager is announced by **Morse Chain Co.,** division of Borg-Warner Corp., Detroit. Mr. Candler formerly was assistant general manager of B-W's Norge Division. **Robert N. Black** has been appointed supply manager of Borg-Warner International Corp.

McCulloch Motors, Los Angeles, appointed **Lewis S. Peck** as personnel manager. He served as personnel manager for Lane Wells Co. and Emsco Derrick & Equipment Co. before his latest appointment.

Orlo E. Brown Jr., research metallurgist, was added to the staff of the West Coast research and development laboratory of **Robertshaw-Fulton Controls Co.** in Los Angeles. He has served as a metallurgist with A. O. Smith Corp. and as a development engineer with Globe-Union Inc. Mr. Brown also was chief metallurgist at Lockheed Aircraft's plant "A" and was associated with Western Gear Works.

A. PAUL SELBY
. . . U. S. Steel asst. to V. P., sales

A. Paul Selby was elected assistant to the sales vice president, **United States Steel Corp. of Delaware,** effective Aug. 1. For the last five years he has been assistant general manager of sales, Carnegie-Illinois Steel Corp., subsidiary. He started his business career in 1907 in the general office of Illinois Steel Co. which later merged with Carnegie Steel Co., and in 1938 was appointed assistant to vice president of sales, Carnegie-Illinois.

A. W. Sawyer was appointed assistant to the vice president, **Lincoln Electric Co.,** Cleveland. He joined the company after graduation from Cornell University and worked in the factory as a methods engineer. Prior to his present appointment he was in charge of development and production of welding instruction aids. In his present position Mr. Sawyer will handle government bids and contracts, and also conduct Lincoln's educational activities.

Baldwin Locomotive Works, Eddystone, Pa., appointed **George F. Walsh** sales promotion manager. His activities will cover sales promotion and advertising as well as general publicity for all product groups. **Robert S. Oberlander** was appointed manager, diesel engine department; **R. G. Tabors** as manager, hydraulic press and power tool department; and **E. R. Wisner** as manager, locomotive department. **E. F. Sheehan** was named manager, renewal parts.

H. J. Hunkele Jr. was named assistant manager of sales engineering division, **Caterpillar Tractor Co.,** Peoria.

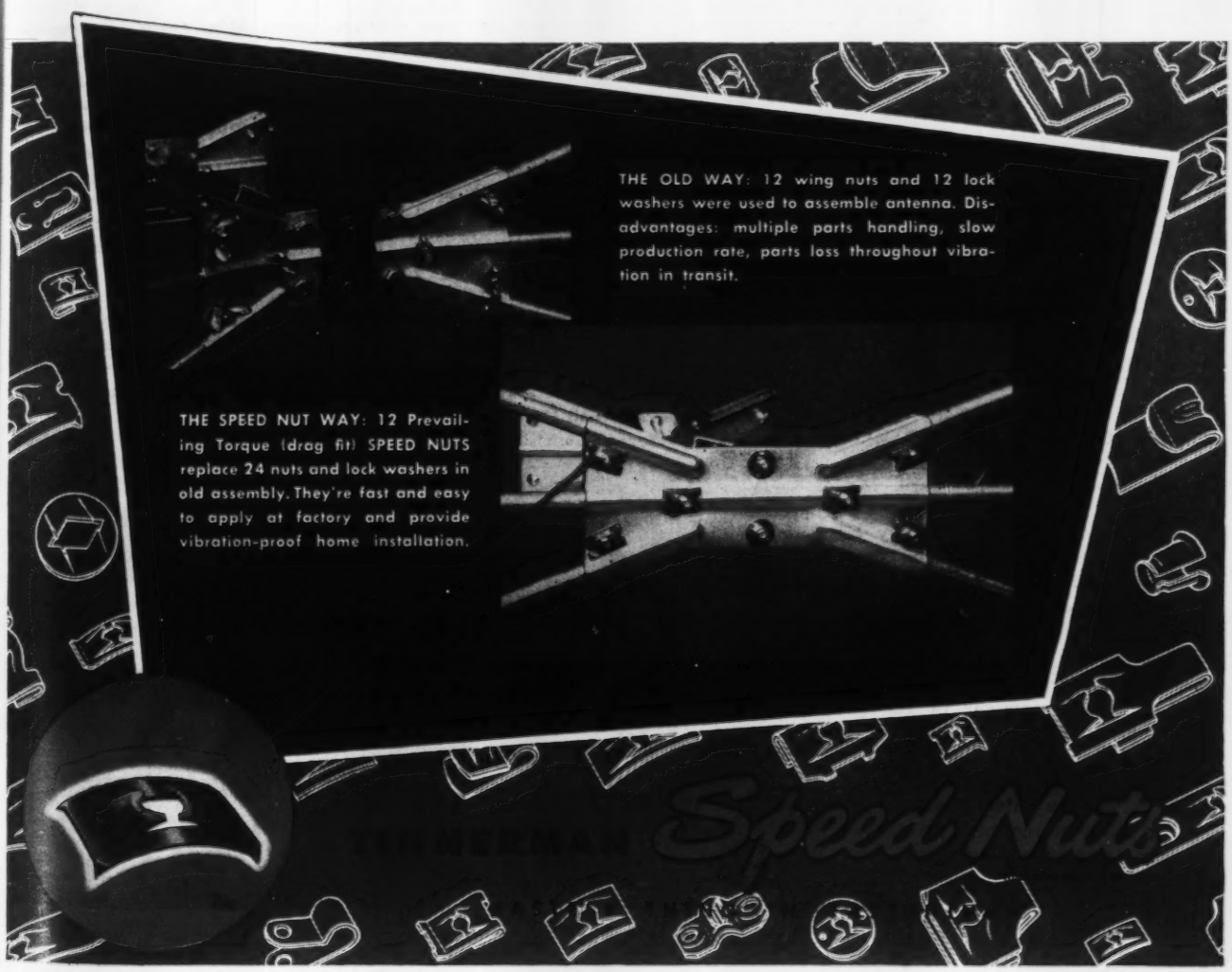
up WITH THE TV ANTENNAS

down WITH THE COSTS!

When SPEED NUTS stepped into the picture for a manufacturer of television antennas, things began to happen—

- Material costs dropped $9.60 per thousand fasteners . . .
- Assembly time costs came down 60% . . .
- Shipping damage was reduced because SPEED NUTS do not vibrate loose—units arrived intact . . .
- And, because SPEED NUTS are self-retaining, erection time of antennas was cut 30%!

All these benefits were gained by Twin-Vex Company, Philadelphia, when they switched to SPEED NUT brand fasteners. Similar advantages can be yours. You can make sure by submitting your product for a thorough Fastening Analysis. Ask your Tinnerman representative for details. Also, write for your copy of "Savings Stories" booklet of actual case histories. TINNERMAN PRODUCTS, INC., Cleveland, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales.


THE OLD WAY: 12 wing nuts and 12 lock washers were used to assemble antenna. Disadvantages: multiple parts handling, slow production rate, parts loss throughout vibration in transit.
THE SPEED NUT WAY: 12 Prevailing Torque (drag fit) SPEED NUTS replace 24 nuts and lock washers in old assembly. They're fast and easy to apply at factory and provide vibration-proof home installation.
TINNERMAN
Speed Nuts

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Ill. His posts with Caterpillar have been as a district sales representative and more recently as special representative in the sales development division. Prior to joining the company he had 11 years of engineering experience in the diesel field.

Deepfreeze Division, Motor Products Corp., North Chicago, Ill., appointed **F. L. Sacha** assistant general sales manager and **F. C. Lowber** to succeed Mr. Sacha as manager of range and water heater sales. **W. S. Hall,** Kansas City district head, was appointed manager of home freezer sales. **E. W. Butler** was named Chicago district sales manager and **H. J. Gastman** product service manager for the central region. **W. A. Costello** was appointed to the new post of sales promotion manager.

Berg L. Meyers is named Addressograph sales manager by **Addressograph-Multigraph Corp.,** Cleveland. Before his appointment he served for six years as Chicago Addressograph branch manager after earlier assignments as sales agent in midwestern states. **Edwin H. Denny** is the first Chicago branch manager for the company. For the last eight years he was national sales manager for the Addressograph Division. Newly appointed as chief aides for Mr. Denny are **E. J. Smythe,** Multigraph Chicago sales manager, and **J. C. Jones,** Addressograph Chicago sales manager.

Appointment of **John L. Hamilton** as general sales manager is announced by **Fentron Steel Works,** Seattle. For the last year Mr. Hamilton was assistant sales manager in charge of marketing and advertising.

Lawrence R. Berkey was elected president of **Illinois Zinc Co.,** Chicago, to succeed **James A. Hill** who was named chairman of the board. Mr. Berkey formerly was secretary and treasurer of the company. **Leroy E. Nelson,** formerly vice president, was named executive vice president and **John S. Flory Jr.** succeeds Mr. Berkey as secretary.

Hyster Co., Portland, Oreg., named **C. E. Houston** manager of its recently opened retail store in Peoria, Ill. Mr. Houston has been connected with the company for a number of years in various sales positions including sales promotional work, retail sales management, expediting and district sales management. Sales territory for the new branch is most of Nebraska, Iowa and northern Illinois.

A. J. GRINDLE
. . . metallurgical consultant, Whiting Corp.

A. J. Grindle is new consulting metallurgical engineer at **Whiting Corp.,** Harvey, Ill., to succeed the late **A. W. Gregg.** Mr. Grindle will work closely with the general sales force on problems involving product application and foundry mechanization. He will also be available to foundry groups and technical organizations as a speaker on foundry equipment topics. Mr. Grindle has been associated with the foundry industry for many years and pioneered the development and application of pulverized fuel for firing air furnaces and annealing ovens for the production of malleable castings. The system he devised and which bears his name was the first to be successfully applied on a commercial scale in the foundry industry.

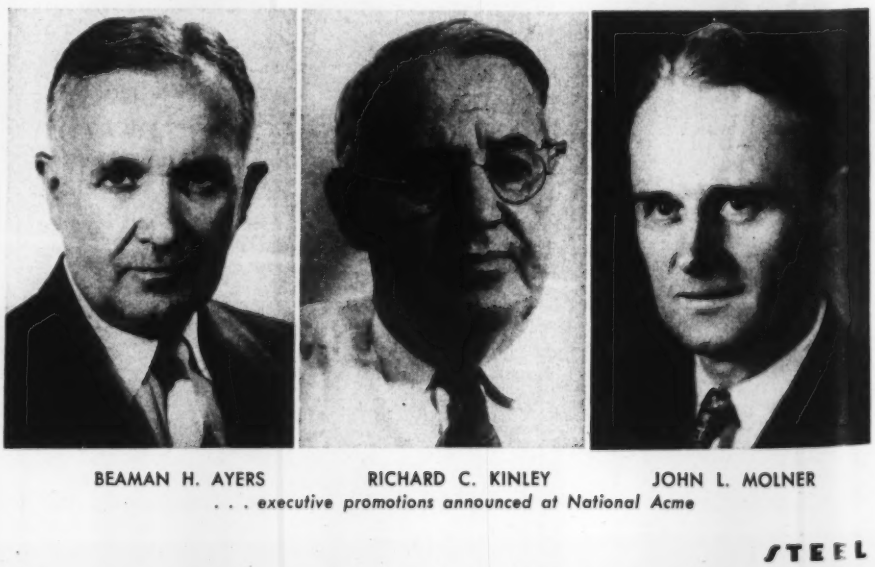
Beaman H. Ayers was elected vice president and works manager, **National Acme Co.,** Cleveland, succeeding **Richard C. Kinley** who retires to a consulting position after 47 years' continuous service with the company. Mr. Ayers started with National Acme at Windsor, Vt., as a toolmaker in 1915. Transferred to Cleveland in 1933 as tool room foreman, he became successively assistant superintendent and general superintendent. He is succeeded as general superintendent by **John L. Molner,** 34 years with National Acme as machine designer, manager of aircraft wheel division, and since 1945 manager of the No. 2 plant devoted to contract manufacturing.

Jonathan A. Bonnell, for the last four years on the pricing and sales desk of **A. B. Murray Co.'s** Elizabeth, N. J., warehouse, has been assigned to cover Essex county, N. J.

Frank W. Leitner, formerly an engineer with Graniteville Co., was appointed a sales engineer for **Reliance Electric & Engineering Co.,** Cleveland. He will be located in Charlotte, N. C., and will act as sales engineer in North and South Carolina.

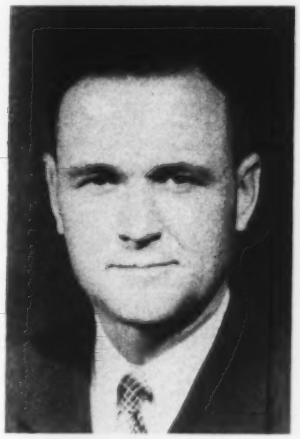
Francis I. Taylor Jr., formerly with Teiner Engineering Corp., has become a New England representative of the industrial castings division, **Hunt-Spiller Mfg. Corp.,** Boston.

Promotions and additions affecting its field staffs, industrial and valve divisions, are announced by **Minneapolis-Honeywell Regulator Co.,** Minneapolis. **Charles F. Woods** is named valve manager for the Southwest with headquarters in Dallas. **Edward J. Byrne** succeeds Mr. Woods as Dallas branch industrial manager. **Howard W. Griesbach** is appointed industrial manager of the Milwaukee branch. Additions to field staffs include: **Louis C. Schultz** to Chicago and **William E. Van Horne** to Rochester, N. Y., for industrial sales; **William J. Kirby** to Los Angeles and **P. R. Vogel**



BEAMAN H. AYERS RICHARD C. KINLEY JOHN L. MOLNER
. . . executive promotions announced at National Acme

LAWRENCE F. BLACK
. . . general superintendent, Geneva Steel



GERALD F. TWIST
. . . Food Machinery vice president

CARL VOORHIES
. . . chief engineer, Chicago Screw division

to Houston on industrial supplies sales.

Lawrence F. Black, formerly assistant chief engineer at American Steel & Wire Co., was named general superintendent of the Geneva, Utah, plant of **Geneva Steel Co.,** U. S. Steel subsidiary. He has been associated with U. S. Steel since 1924 when he began working at AS&W's Donora steel and wire works. Mr. Black held a number of positions at the company's plants until his selection as assistant chief engineer in 1948.

Election of **Gerald F. Twist** as a vice president is announced by **Food Machinery & Chemical Corp.,** San Jose Calif. He is manager of the company's Peerless Pump Division. Mr. Twist joined FMC in 1930 and later was associated with Atlas Imperial Diesel Engine Co. where he eventually became executive vice president and a director. In 1947 he rejoined FMC and took charge of Stokes & Smith Co., a subsidiary. Last year Mr. Twist became manager of Peerless Pump with headquarters in Los Angeles.

Carl Voorhies was appointed chief engineer, valve tappet division, **Chicago Screw Co.,** Bellwood, Ill. In addition to research and experimental work on hydraulic valve tappets for use in new type high-compression overhead valve engines, he will supervise activities of a fully equipped laboratory for customer service in the solution of valve lifter and valve gear problems. Mr. Voorhies joins Chicago Screw after two years spent as consultant to several automotive manufacturers and 16 years in specialized valve gear work.

OBITUARIES...

William A. Hauck, 64, died July 29 in Doctors Hospital, Washington. During World War II he was an executive in the Iron and Steel Division, War Production Board and its predecessors. He was the author of a report "Steel Expansion for War" that appeared in STEEL, June 18, 1945. Recently he made a confidential survey evaluating possible steel expansion needs in the event of another war. Mr. Hauck was in charge of the sale of surplus steel properties by the War Assets Administration. Among sales he managed was the sale of the government-owned steel plant at Geneva, Utah, in 1946 to U. S. Steel Corp. Before the war Mr. Hauck held executive posts with Bethlehem Steel Co. and Lukens Steel Co.

Frank Eckel, 81, former vice president, **Eckel-Nye Steel Corp.,** Syracuse, N. Y., died July 23. The firm discontinued operations in 1942.

Clyde E. Cochran, 72, former director of engineering, **Elwell-Parker Electric Co.,** Cleveland, died recently. He retired in 1946 after 44 years' association with the company.

William J. Grippin, 73, retired treasurer and a director, **Eastern Malleable Iron Co.,** Naugatuck, Conn., died July 25 at his home in Fairfield, Conn.

Floyd Rose, 73, who retired in 1949 as chairman of the board of **Firth Sterling Steel & Carbide Corp.,** died at his summer home in Hyannis Port, Mass., on July 29. Other steel companies in which Mr. Rose held executive posts were Vanadium Steel Co., Heppenstall Steel Co. and Portsmouth Steel Co.

Henry Pope, 82, who retired in 1945 after serving as both president and chairman of the board of **National Malleable & Steel Castings Co.,** Cleveland, died July 28. He had served 61 years with National Malleable and its predecessor companies.

Arthur H. Tinnerman, 79, who retired in March of this year as vice president, **Wagner Electric Corp.,** St. Louis, died July 18. He became ill while on a vacation trip and had been confined in a Dallas hospital for several weeks before his death.

Harry F. Idzkowsky, 66, since 1927 safety director of **Mine Safety Appliances Co.,** Pittsburgh, died July 4. Under his direction the company won the National Safety Council's contest in its division four consecutive years and again in the 1948-49 competition.

Ralph J. Weimer Sr., 54, assistant general sales manager of **Lamson & Sessions Co.,** Cleveland, died July 30. He collapsed while taking a vacation cruise on a freighter just as the vessel was passing through the locks at Sault Ste. Marie, Mich.

Earl P. Disbro, 66, president of **W. S. Tyler Co.,** Cleveland, and associated with that company for a half century, died July 29. He had suffered a coronary thrombosis two weeks earlier.

Ben L. Marcus, 75, last of the three founders of **Nieder and Marcus,** Seattle salvage firm organized 50 years ago, died July 26.

Harold Davey, 63, steel manufacturers' representative and former sales manager in the Detroit area for **W. H. Davey Steel Co.,** died July 29 of a heart attack.

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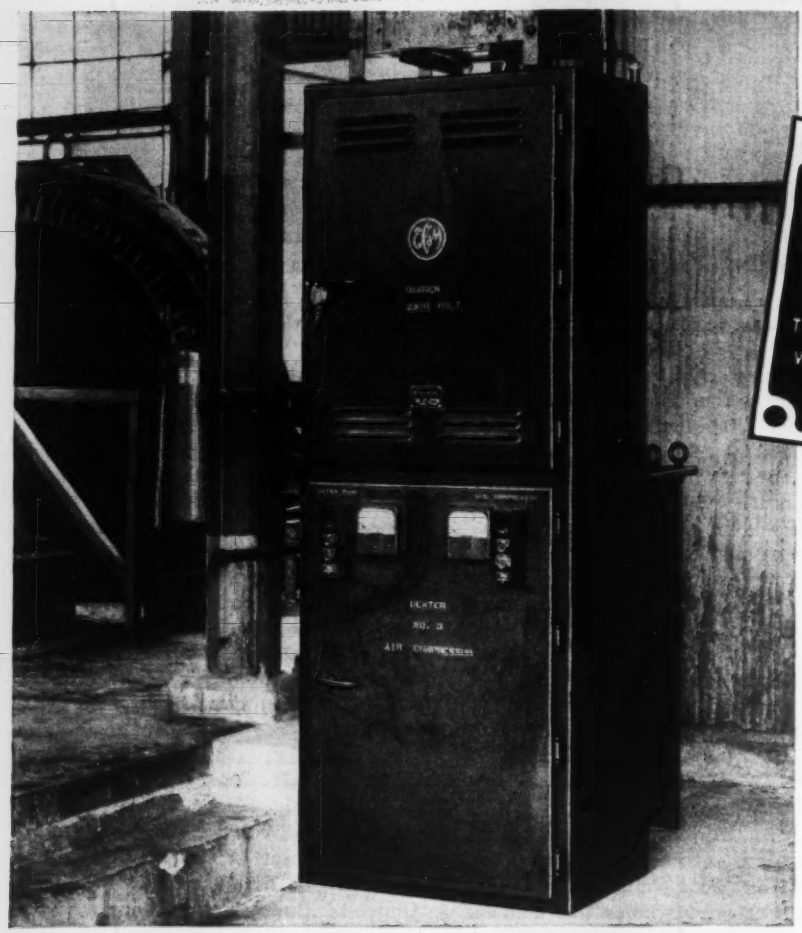
UNLIMITED KVA PROTECTION
for this 400 HP, 2300 Volt Synchronous Motor



Steel Mill Air-Compressor Installation

Nothing to Replace-No Calculations-No Change later on with EC&M VALIMITOR (Volt-Ampere-Limitor) Motor Starters

Simplified *short circuit protection* without a ceiling—because under a fault condition, the maximum fault current is limited to 25,000 KVA or less (steady state current). The well-known EC&M Type ZHS heavy-duty, magnetic contactor used in VALIMITOR Starters clears such faults quickly.

Because protection is *unlimited*—there's no need to calculate existing short circuit capability—no need to fear that these starters will be out-moded by future growth in KVA. And when a short occurs, there's nothing to replace—no spares to stock—no time out for replacement. To restart—just press the start button.

For purchasing simplicity, EC&M VALIMITOR Starters for 2300-4600 volt motors have no equal. Specify only horsepower-size, voltage, phase and frequency. EC&M VALIMITOR Starters give effective protection at all times—during starting, accelerating and running, *irrespective of KVA capacity* or *magnitude of fault*.

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THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

WATCH ZIRCONIUM— Better keep an eye on zirconium. Indications are that it may present some surprises reminiscent of titanium. Its latest use is reported by the Air Materiel Command's aircraft lab, Dayton, O., in connection with an all-magnesium-alloy airplane now in the planning stage. Wings of the contemplated craft are made entirely of magnesium-zirconium alloy. These employ a thick, unreinforced skin as surface covering in place of conventional stringer-reinforced, thinskin type construction. The new type wing already has undergone extensive tests, being flown on the F-80 for 120 hours without showing any adverse structural characteristics. The Air Force also says it requires 31 per cent of the parts and 38 per cent of the fastenings found in the conventional wing.

NEW V-BELT MATERIAL— Du Pont Co. currently is evaluating possibilities of a new synthetic fiber in such applications as fire hose and V-belts. The material is a condensation polymer obtained from ethylene glycol and terephthalic acid. It has high tensile strength, high resistance to stretching—wet or dry, and good resistance to abrasion.

ROLLING PROVIDES THE ANSWER— Best brazing results, metallurgists find, are obtained where the thickness of the joint is between 0.001 and 0.002-inch. But to obtain uniform joints of close to this thickness is somewhat of a stumbling block. Most of the trouble comes from the thickness of brazing alloy used. Now, the whole trouble seems to be lessened by a new rolling process developed by Westinghouse engineers. This, they say, reduces phos-copper strip to a thickness of 0.005-inch and less. The method which also provides a more ductile alloy strip that is easier to handle, consists of heating the strip by the resistance method, then passing an electric current through it while it is being rolled. The technique assures that the metal is hottest as it reaches the rolls. As the current can be regulated, rolling speed of the process can be much higher than previous methods.

ONLY THE "SKIN" DISTURBED— Whenever metals do not have to be worked to a bright finish, sandblasting is a better method of cleaning welds on stainless and corrosion-resistant steels, says a finisher at the Philadelphia Naval shipyard. Besides being faster than other methods, sandblasting does not affect properties of cold-rolled steel—other than roughening the surface surrounding the weld.

NOW YOU KNOW— Ever wonder how the welds on the welded ferrule of your garden rake or hoe were made? The welding operation is unique and fast. Setup at Winzeler Stamping Co., Montpelier, O., which turns out over 12,000 ferrules per 8-hour day, will give you a fair idea how it's done. The company uses six semiautomatic oxyacetylene welding setups to achieve its output. Each consists of a fixed position Airco welding torch and tip, gasaver and jig. In the operation, a ferrule is placed in the jig and slid past the torch, the treadle-operated gasaver cutting the welding flame in. Operator then pulls the ferrule back through the welding flame. By the time it is past the welding tip, its seam is fused. This welding operation Winzeler says eliminates necessity of bolting the ferrule to a handle or shaft.

DOUBLE MISSION — When GM's Frigidaire Division set out to step up brazing operations on its meter miser compressor—the unit that houses the freezing mechanism of the refrigerator it makes—two things happened: Production increased and much floor space was saved. How was it done? By keeping materials moving at all times—by-passing such previous expedients as stockpiling at strategic locations. (p. 84)

"SHOCK-PROOF" MATERIAL— Thermal shock presents no problem for a new chromium-alumina material reported to withstand the thermal shock of being plunged from room temperature into molten steel at 3000° F. Currently, the metal-ceramic is undergoing various industrial tests. It already has shown up well in form of components for ram jets. Used as thermocouple protection tubes for immersion in molten metals, the materials withstood as many as 20 immersions without showing evidence of corrosion. (p. 88)

MECHANICAL "MASTERS" — Just at the time when some gloomy prophets were predicting the "low ceiling" over diemaking would stunt the growth of die-using industries, the ingenuity of machine tool inventors came to the rescue. In view of the limited number of skilled diesinkers it provided the "shot-in-the-arm" to keep pace with the increased use of dies. The machines now used for the purpose vary in size all the way from huge machine tools capable of handling large auto dies down to small machines for cutting dies for striking coins. (p. 90)

NOT LIMITED TO BARS—The term "bar mill" does not limit the mill to producing bars only, C. W. Barrett, chairman of the bar mill committee for Republic points out in his article on the production of bars. He says products such as rods, billets, slabs, plates and skelp may be produced on the same mill. Size classification of bar mills, he explains, vary from 8 to 34 inches inclusive, and depend on the diversification of product requirements. The size commonly spoken of as mill size on bar mills is the pitch diameter of the driving pinions. (p. 94)

PRODUCTIC ENGINEERI NEWS PROD
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Materials-on-the-Move Increase

Necessity of building up stockpiles at strategic locations and need of extra floor space for such are eliminated by Frigidaire's system of handling compressor shells prior to and during brazing

Photography by Dan Reebel

KEEPING materials on the move, like the juggler who maintains several balls in the air at one time, is the key to GM's Frigidaire Division's handling techniques in its brazing operations.

The setup which permits complete utilization of a brazing furnace's capacity in the company's No. 1 plant does two things: Increases production and saves floor space.

In brazing the upper shell of the meter miser unit which houses the freezing mechanism of a Frigidaire refrigerator, for example, the processing is boosted to one every four minutes. The banking problem is no longer existent because parts are continuously on the move. Also, all extra handling previously required is eliminated by including in the materials handling sequence advantages of automatic feed and discharge in connection with the brazing furnace.

How System Works—Here's how the Dayton, O., plant processes the shells:

First they are transported to the brazing area by overhead monorail conveyors at the rate of 25 feet per minute. As they progress toward the brazing furnace several operations take place.

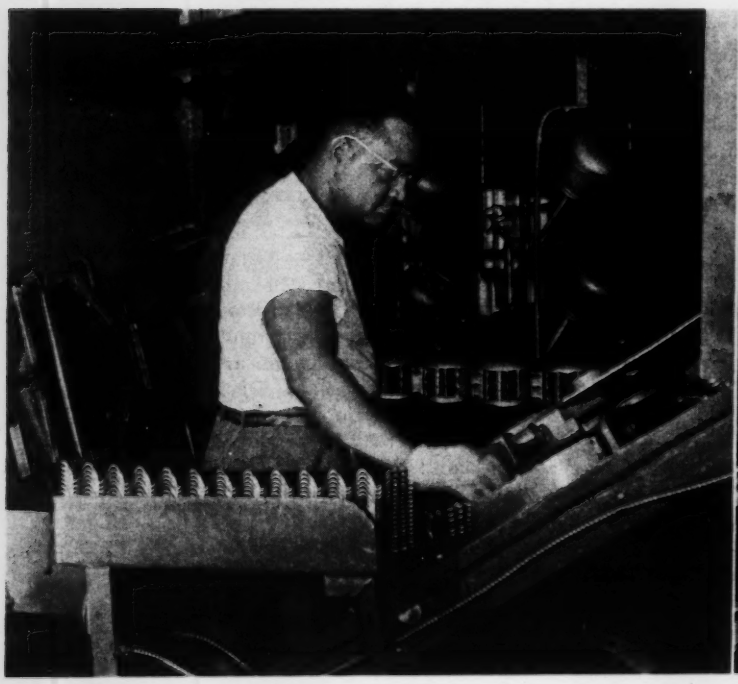
At the first, each shell is removed from the moving conveyor and a fin is welded to its outside with a special projection welder. The operator than places the shell on a roller type conveyor. This feeds it to the next operator who assembles the mounting pads and terminal bushings by hand. The part then moves on to the next operator where the additions are pressed in place on a special hydraulic press.

"Rolling" Continues—Placed back again on the roller gravity conveyor, the part moves to the next station where the charging body is assembled and placed on another hydraulic press. Another roller gravity conveyor takes the shell into a welding booth where the charging body is tacked on with an arc welder.

From the arc welding booth, another overhead conveyor assumes the transportation task, taking the part near the brazing furnace where it is placed on a brazing shoe. The shoes each hold eight shells. When loaded, they move down a track that takes the shells in and out of the brazing furnace automatically at the rate of one every four minutes. As the brazed shells emerge from the furnace they are hung onto racks of the overhead conveyor.

Brazing furnace used is operated at a temperature

Shell and a rolled fin are placed in this projection welder which joins the fin to the outside shell. Overhead monorail conveyor which delivers shells to welding operator is in background

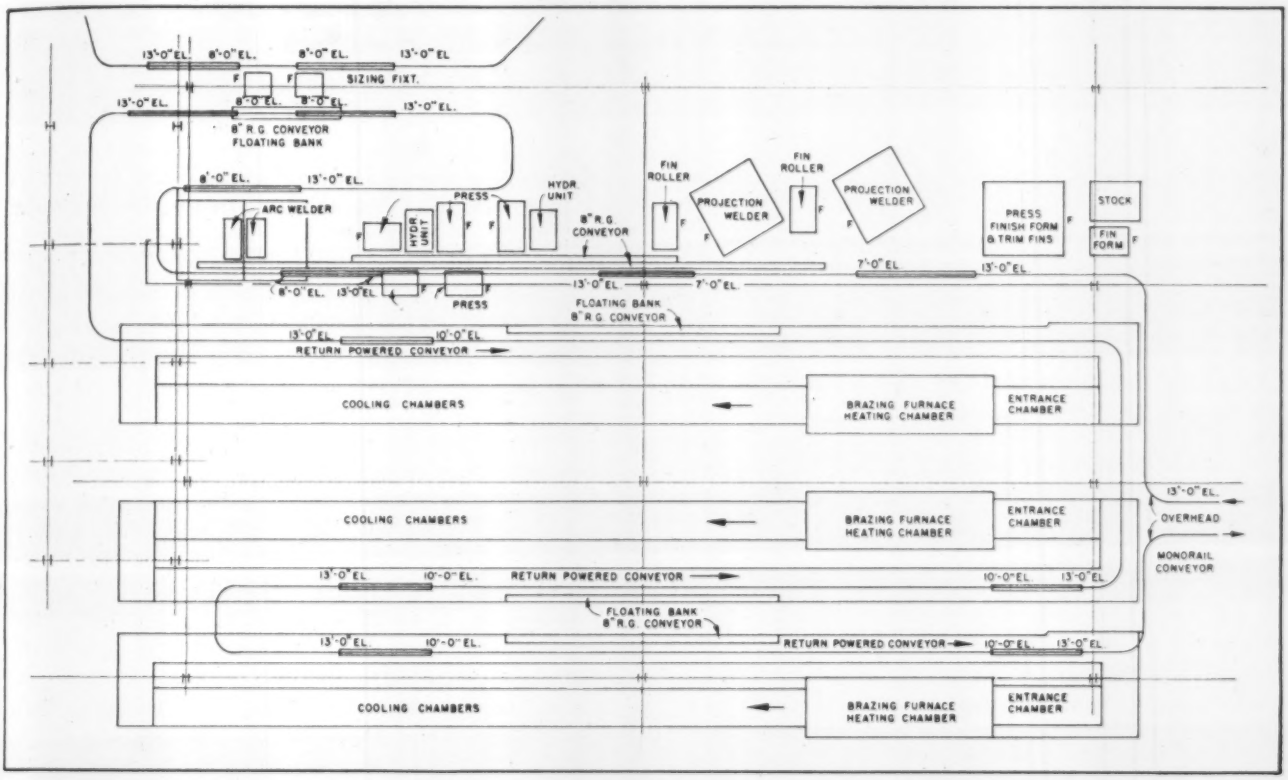


This hydraulic press is employed to assemble charging body into top of shells. Shells then are disposed on the inclined roller gravity conveyor shown at right of the operator

Brazing Production

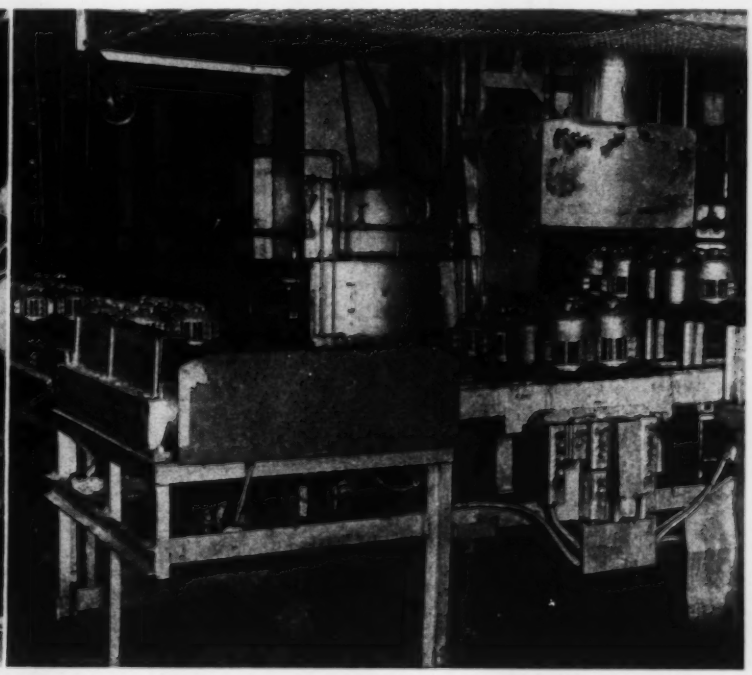
of 2050° F, and is capable of handling 2300 pounds of work per hour. It heats the work in a chamber 17 feet long and cools it in a chamber 70 feet in length. Operation of the furnace is entirely automatic. Its charging mechanism is electric eye controlled. One eye, outside the door, permits the mechanism to function when a tray is in place. The other, a few feet within the charging vestibule, permits the tray to enter automatically as soon as the preceding one is cleared.

Sketch showing how materials are kept on the move in Frigidaire's plant



Here's how shells are loaded onto shoes as they travel on the return conveyor of the brazing furnace. Shoes travel automatically through a brazing cycle and back to this point

Shoe load of shells about to enter brazing furnace. Note other loaded shoes following in equal spaced distances. These too are automatically transferred across end and into furnace



Water-Cooled Engine Block Gravity Die Cast

Complicated design of a twin-cylinder, water-cooled aluminum engine block is no stopper for permanent mold casting methods

INTRICATE twin cylinder water-cooled aluminum engine block is one of the latest products to be cast by permanent mold techniques at the St. Paul plant of Progress Pattern & Foundry Co. The company has had plenty of experience for this job. Utilizing 14 specially built tilting machines, Progress' production of aluminum and aluminum alloy castings by the Wessel system of gravity die casting has ranged from castings weighing less than an ounce to 20 pounds or more.

Tackling the engine block job, Progress engineers first set about analyzing the complicated design features of the block. They had to determine what dimensional factors were to be maintained, what metal sections were required. It was also necessary for them to assure that all conditions necessary to a successful casting operation would be satisfied.

Mold Model Made—First, a model of the mold was made. Then a plaster casting was poured to determine: (1) The metal sections, deciding whether or not they were too light or too heavy for successful casting; (2) if partings of the mold were correct; (3) if the actuating mechanisms of the core draws functioned properly; (4) if the metal thickness of the die itself was such as to provide proper thermal conductivity to keep the mold at the proper temperature at all times during the casting cycle.

As a result of this procedure it was learned that excessive thicknesses of the metal could be reduced without impairing the casting, to provide a greater uniformity of metal sections, and savings in metal as well. The minor design changes were agreed upon, and production was started with development of the wood pattern for the permanent mold die.

Die Cast Iron—In making the pattern, care was taken to allow for shrinkage of the iron from which the die was cast. The company utilizies special cast iron in preference to machining the mold from a solid because this method facilitates holding the outside contour of the die, as it pertains to the cavity shape, to uniform thickness. Allowance was also made to permit finish on all joints and cores that can be machined readily.

Provision for proper gating was also an important consideration in making the pattern. In gravity die casting, it is imperative that the back or gate end of the mold is made large or thick enough to maintain proper metal temperature. This is the hottest part of the mold since all the metal received by the mold passes over this area. Therefore the heat must be dissipated faster than in other parts of the mold.

Porosity Dangerous—Sometimes even though a die mold as cast has all the appearance of a close-grained

Fig. 1—Battery of tilting machines that is used for gravity die casting

structure, machining may reveal the presence of porosity. Porosity will disrupt the uniform thermal conductivity of the mold while pouring. Since thermal conductivity of the die is the primary means by which heat is dissipated from the casting at the proper rate to insure the desired temperature throughout the casting cycle, extreme care is taken during the special processes in designing of dies.

Upon completion of the die casting, the iron was annealed to specification, which is at no time softer than 240 brinell nor harder than 265 brinell, to avoid excessive machining costs.

After normalizing, dies were taken to the die shop for inspection and checking of critical dimensions. The next step consisted of machining the joint of the cavity, and then the cavity itself, and applying all integral cores to the mold. (These are cores that do not need to be extracted). Then the cores of the exhaust and water jacket were machined separately, Fig. 3. "A" is exhaust core; "B" is water chamber core.

"A" and "B" cores were so constructed that "A" could be withdrawn approximately ½-inch, after which shoulder bolts would contact core "B", and it too would be withdrawn as one unit, Fig. 4. "C" is cylinder bore core; "D" is water chamber core. "C" was also withdrawn approximately ½-inch again to remove progressively the core cluster.

Cores Withdrawn by Rack and Gear—In making permanent mold dies for gravity die casting, the plant has found it expedient to use a rack and gear combination for withdrawing cores. This method withdraws cores on a position straight line without binding. However, a toggle lever can be used to pull small cores that will be withdrawn only a short distance.

Opening Device Acts as Clamp—Clamping the die is highly important. For this specific casting the opening and closing device acts as a clamp, and one other clamp is used to hold the die together during the pouring. It is not necessary to put a great strain on the die cavity by clamping, since the casting is poured by gravity alone. Provision also was made for proper venting.

Next, the die was completely assembled and mounted on a mock-up pouring machine. At this time the mechanisms of the die were operated to check and adjust tolerances to allow free movement of the cores at normal operating temperature.

Casting Machine Simple—The casting machine used for gravity die casting at the plant is simple in principle. It is essentially a box-type holding furnace which also provides for pouring the castings. It is suspended on trunions and mounted on a base. The furnace is lined with a plastic refractory capable of withstanding the temperature required for pouring aluminum and aluminum alloy castings. Correct temperature of the bath is maintained by an electrical indicating and controlling millivoltmeter pyrometer.

Hydraulic mechanisms control tilting of the casting machine, and its return at the end of the casting cycle for each consecutive pour. To insure a uniform cycle, the machine has a timing device set to maintain the rate of pour determined by the nature of the casting.

Pushbutton Controls Tilt—To start operation of the casting machine which has the die attached, contact is made by electric push-button control to tilt the machine. The molten metal then flows through the gate and by gravity follows the lowest channel of the cavity and rises pro- (*Please turn to Page* 108)

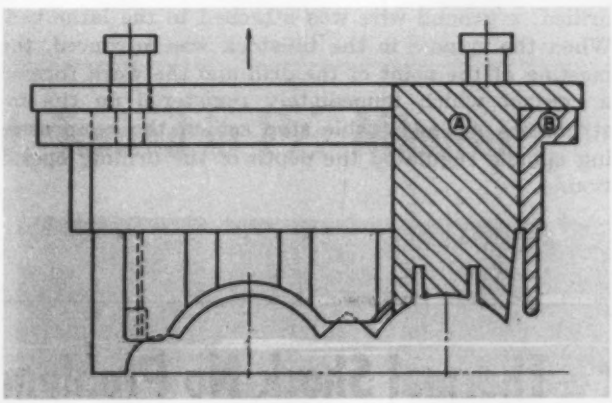


Fig. 3 (above)—Detail of exhaust core (A) and water chamber core (B)

Fig. 4 (below)—Cylinder bore cores (C) and water chamber core (D)

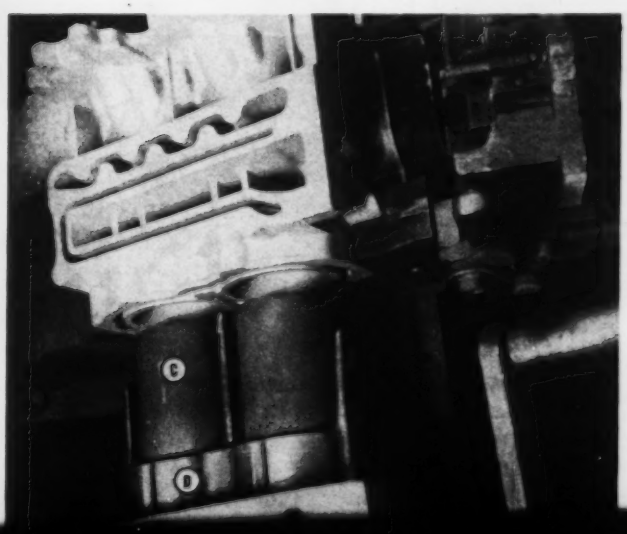
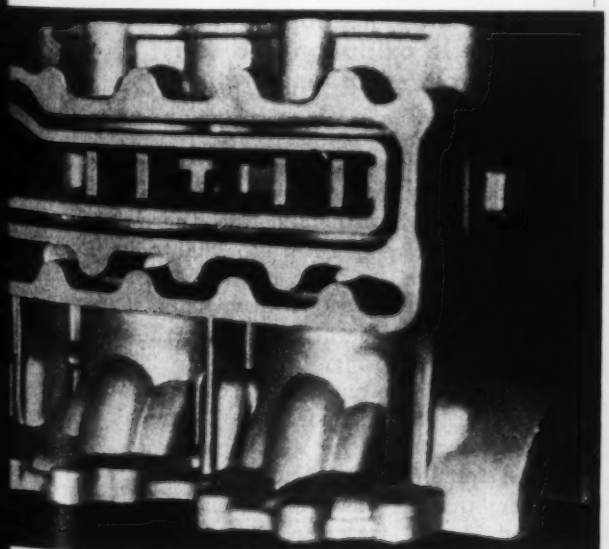


Fig. 2—Twin cylinder water-cooled engine block



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Hole Drilled Half Diameter of Human Hair

EYE of a needle, usually thought of as a small hole, could be called a good-sized chasm when compared with a hole drilled by a technician at the Naval Ordnance Laboratory, White Oak, Md.

Measuring 60/100,000-inch in diameter, about one-half the diameter of a human hair, the minute opening was drilled in a piece of platinum used in the hydraulic system of a new Navy weapon.

Who makes a drill that small? This problem was met by filing down a 4/1000-inch diameter pivot drill. Attached to a standard jeweler's lathe, the drill was centered by means of a microscope during stoning.

Mechanical "Feeling" Required—In the drilling of the tiny hole, it was necessary to determine when the drill made contact with the platinum. To accomplish this, the platinum was secured to a face plate which was electrically insulated. Shank of the face plate containing the platinum was then placed in a collet and the entire system inserted in the reciprocating spindle of the tail stock. Fig. 1 shows the lathe as set up for the drilling.

Clamp of a "hot" wire of an ohmmeter was attached to the insulated face plate holding the work to be drilled; a ground wire was attached to the lathe bed. When the spindle in the tailstock was advanced, the meeting of the point of the drill and the work formed a contact which immediately registered on the instrument. An adjustable stop set on the reciprocating spindle regulated the depth of the drilling operation.

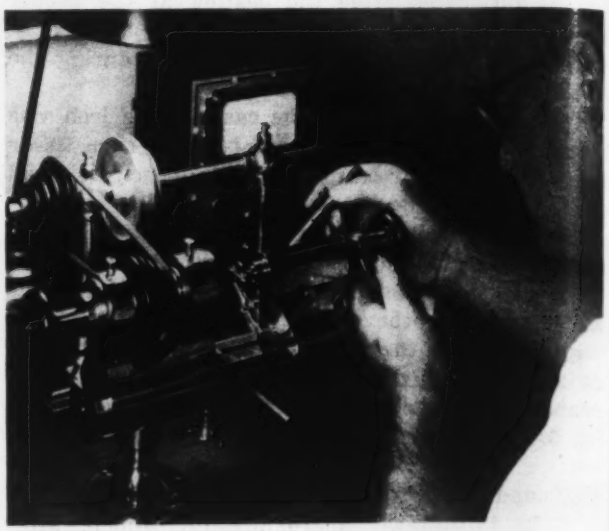

Fig. 1—Jeweler's lathe set up for drilling the 60/100,000-inch hole. Note electrical connections and ohmmeter in background

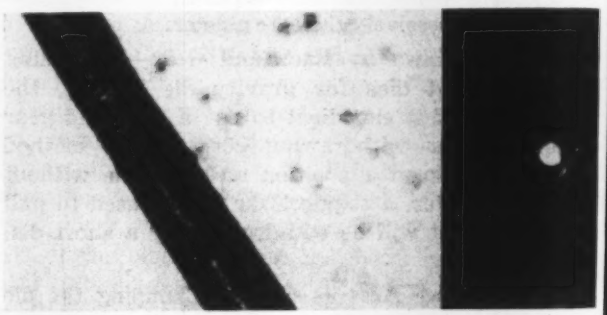

Fig. 2—Compare size of hole right with the diameter of the human hair left; both magnified 108 times

Thermal Shock No Problem For New Metal-Ceramic

Tested for a number of high-temperature industrial applications, a new chromium-alumina material has good resistance to oxidation and can withstand the thermal shock of being plunged from room temperature into molten steel at 3000° F

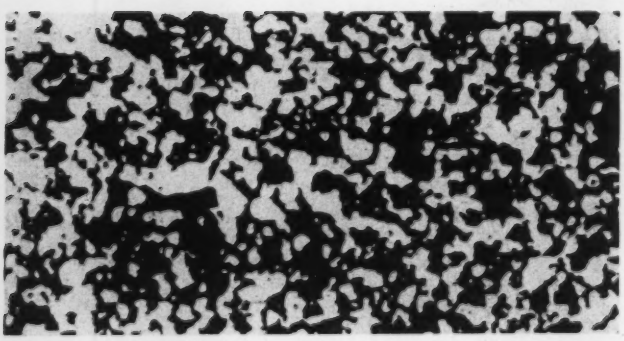

Fig. 1—Microstructure of metal-ceramic material. Black constituent is ceramic; white is metallic

TUBES of a new metal-ceramic can be plunged into molten steel and withstand the thermal shock of going from room temperature to 2800 to 3000° F without attack from slag or metal. Flame electrodes tested in various gaseous atmospheres have withstood oxidizing temperatures under these conditions in a temperature range of 2400 to 2800° F. Most metals become molten at these temperatures, and ceramics because of their poor electrical conductivity are not suitable for this application.

Tested for Industrial Use—Properties of the new chromium-alumina material, designated LT-1, were discussed at the American Electrochemical Society's

97th meeting, by W. O. Sweeny, Haynes Stellite Division, Union Carbide and Carbon Corp., New York. Sweeny said the new Metamic material has been tested for a number of industrial applications. It has shown excellent promise for strength resistance to oxidation at elevated temperatures and for thermal shock.

Thermocouple protection tubes for immersion in molten steel, cast iron, brass, bronze and other metals except aluminum have shown up well on test. They last longer and give quicker readings because of their excellent thermal conductivity. After as many as 20 immersions, there has been no evidence of any corrosion from the molten metals.

Typical Metallic Appearance—Fig. 1 shows a typical micro structure of LT-1. The black constituent is ceramic and the white is metallic.

LT-1 is dull gray or green in the as-fired condition, but has a typical metallic appearance when ground or machined. Fig. 2 shows typical parts made from the material, such as combustion heater tubes, high intensity burner tip, high temperature rack and roller pinion, conical flame nozzle, bolts for high temperature apparatus, etc.

It has been tested in several parts for ram jets; gas temperature in this application is around 3000°F. Sweeny reported that both production and experimental gas-turbine nozzles are being fabricated of the metal-ceramic material. According to Sweeny, these nozzles will permit higher gas temperatures.

Fig. 2—Typical parts made from Metamic metal ceramics. Courtesy Haynes Stellite Div., Union Carbide & Carbon Corp. (1) 50cc crucible; (2) combustion heater tube, (3) high intensity burner tip, (4) high temperature rack and roller pinion, (5,6) bolts for high-temperature apparatus, (7) deflection plate for molten slag, (8) hot tensile test coupon, (9) conical flame nozzle, (10) hot gas sampling tube 14 inches long, with 0.020-inch orifice in hot end

Transmission Part Faced, Bored, Turned in 1½ Minutes

FAST facing, boring and turning of a Packard Ultramatic transmission part are performed in a cycle time of 1.55 minutes using a special machining setup. After roughing and some finishing, the converter clutch piston, made from a gray iron annular ring is finish machined to close tolerances on a vertical spindle Hoern & Dilts machine, built specially for the job.

With spindle turning at 200 rpm, work is held bottom up against a special faceplate having a ring that fits the annular groove previously finished on the under face. Tools are carried on slides arranged to move both vertically and horizontally. All cuts are light and all are made by single-point carbide tools. One of these turns the outside diameter and another bores the inside diameter.

A third tool faces the top; two others rough and finish face the under side of the shoulder. These latter cuts plus the top facing and turning of the outside diameter finish the narrow flange or step diameter in preparation for broaching of the teeth that take the place of splines around the periphery and fit mating teeth of the outer member of the clutch.

Setup for boring, turning and facing operations on a cast gray iron annular ring which becomes the clutch piston

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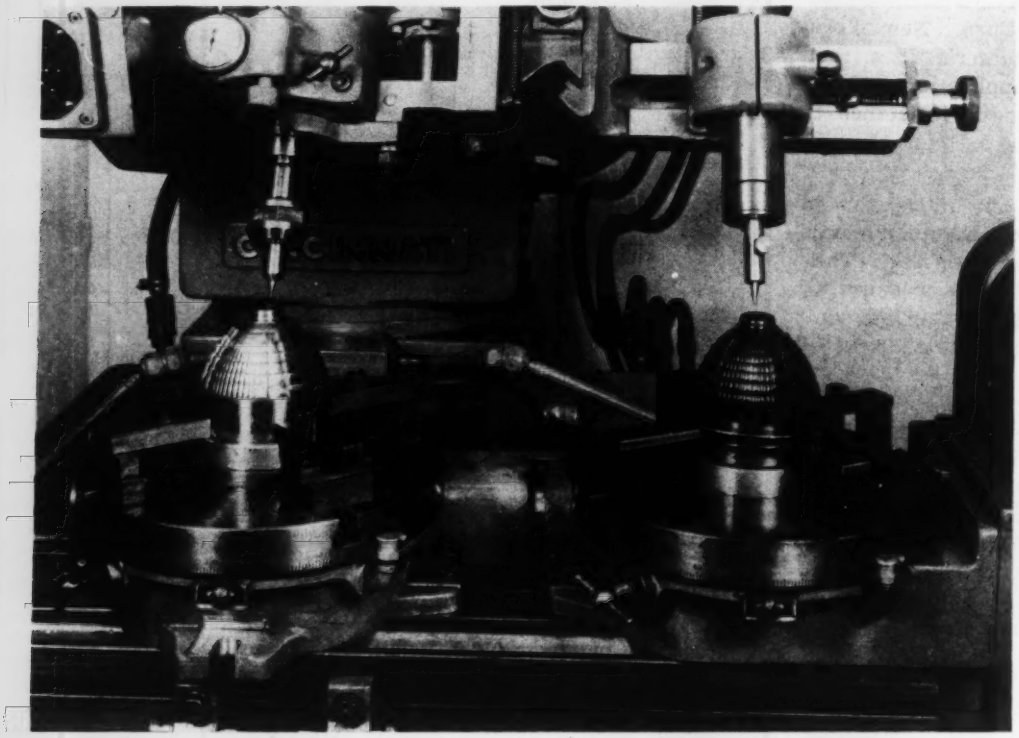
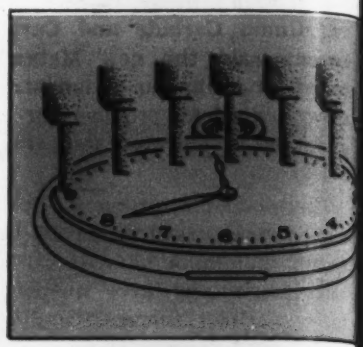


Fig. 1 (above)—Stainless steel plunger for molding glass reflectors, on rotary table at left, has been cut as exact duplicate of "master" on table at right, through automatic tracer control of high speed end mill



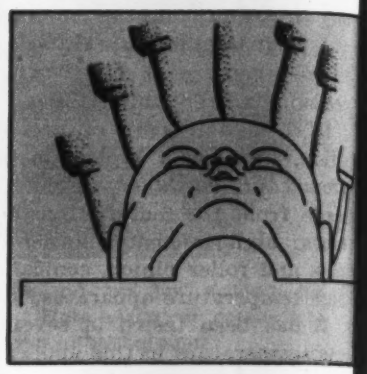


Fig. 2 (above)—Crystal of pocket watch in upper sketch is playing role of "master" for "revolving job" on which cylindrical tracer and cutter mounted in vertical spindles could be used. Lower sketch represents actual "reciprocating job" requiring conical tracer and cutter and angular settings of spindles

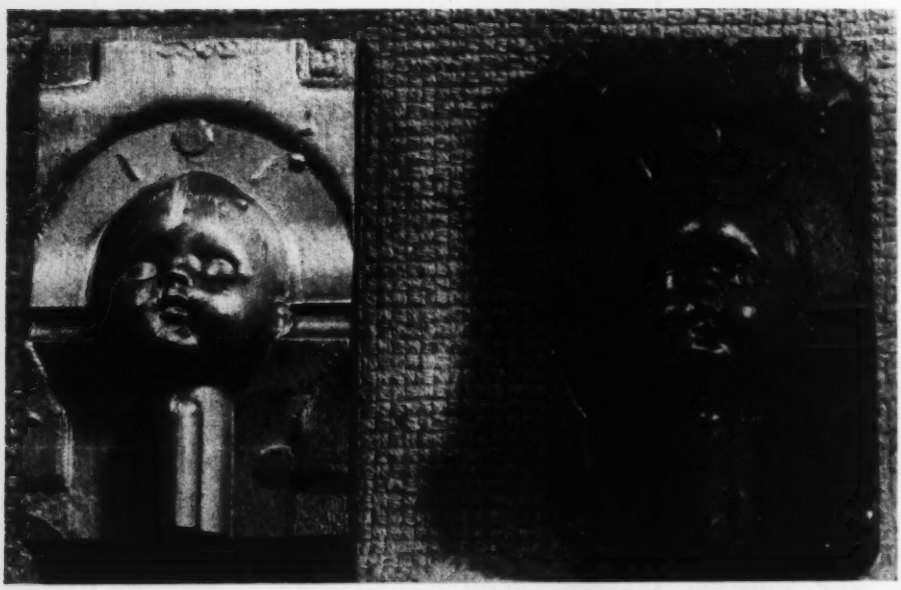


Fig. 3 (left)—Image at right is "master" made of composition cement, from which steel hob at left has been cut by reciprocating method in automatic duplicating machine

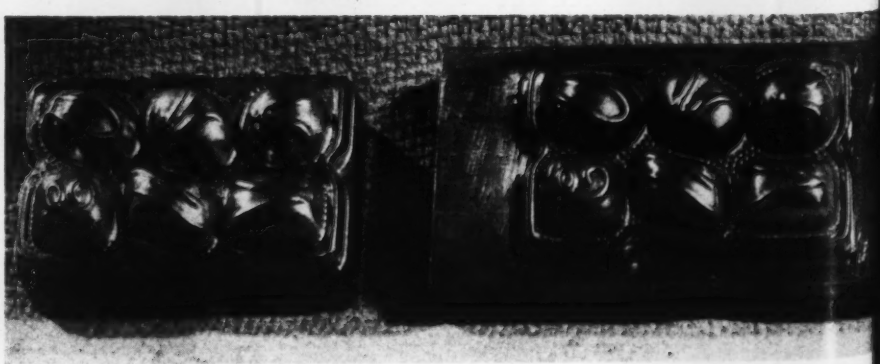


Fig. 4 (right)—Steel "master" at right, duplicated from cast of hand-dipped chocolates, in turn is used to guide tracer for cutting punch press dies (left) for sheet metal molds that are used in candy factories

Mechanical Die Cutting Breaks Production Bottleneck

Methods for automatic reproduction of plaster or wooden "masters" in blocks of iron and steel are largely responsible for modern mass production of parts in precision molds and dies

By A. PLIMMER
Die Sinking Specialist
Cincinnati Milling & Grinding Machines Inc.
Cincinnati

IN addition to providing more, better and less costly goods for more people, highly mechanized manufacturing as developed in the United States has on many occasions furnished the solution for serious tool engineering problems directly created by the rise of mass production.

A shining example is the mechanical cutting of dies now used in such profusion in forging, stamping and forming, diecasting, glass, rubber and plastics molding, etc.

In the early days of drop forging and sheet metal press forming, dies were cut or "sunk" by hand. This was a slow, tedious process—one demanding highly developed manual skill gained only through long apprenticeship and years of experience.

Skilled diesinkers therefore were bound to be limited in number. With rapid increase in volume of metalworking in dies, and with broadened use of cut dies in fields other than forging and stamping, the die sinking situation rapidly became acute.

Controls Lift Ceiling—Then just at the time when some gloomy prophets were predicting the "low ceiling" over diemaking would stunt the growth of die-using industries, ingenuity of machine tool inventors solved this problem through the introduction of mechanical die cutting in "master controlled" machines.

Machines of this kind are now in wide use. They vary in size all the way from huge machine tools capable of master controlled cutting of the largest automobile body dies, down to small machines with pantograph tracers for cutting dies for striking coins and medals. Some of these machines have electromagnetic controls, some have mechanical or hydraulic controls. Some are tool room milling machines with form following and cutter controlling attachments. These machines now have the ability to cut dies which require little or no hand finishing—thus effectively breaking the bottleneck created by shortage of die cutting craftsman.

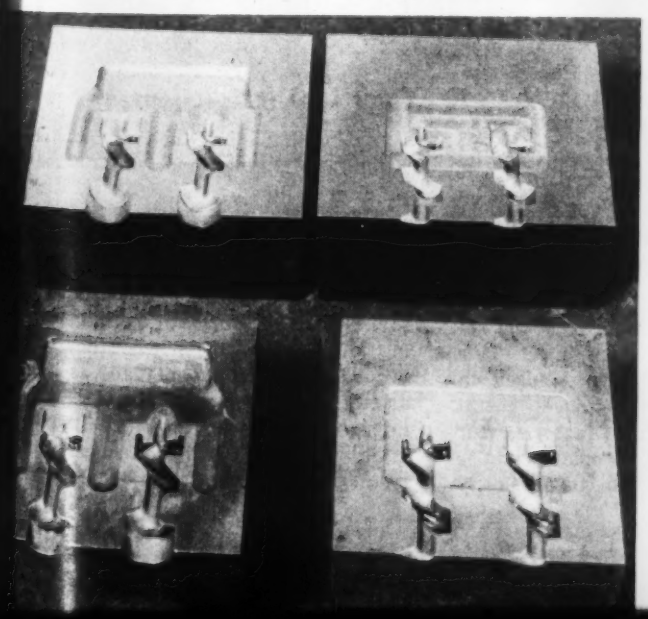
Wide Performance Range—The machine on which the die cutting jobs featured in this article were performed is an 8 x 18-inch Cincinnati tool and die milling machine equipped with fractional horsepower motor driven duplex rotary table attachment. As indicated by Fig. 1, this combination constitutes an efficient automatic duplicating machine capable of highly effective performance on a wide variety of small and medium size dies.

The job setup in the illustration just mentioned is a typical one. It is a stainless steel plunger for molding a glass reflector. The plunger is mounted on the left hand rotary table, while the master, which automatically controls the cutting action, is mounted on the right hand table.

Size and shape of the master is reproduced in the workpiece—when using the rotary method—through combined motions of three elements: (1) Vertical movement of the head or spindle carrier under control of the sensitive hydraulic tracing finger mechanism; (2) identical rotation of two circular tables; and (3) cross feed movement of the saddle carrying those tables. Once a cut is started no attention other than periodic inspection is required until it is time to start another cut.

Speed for Every Material—The rotary tables have eight speeds ranging from ¼ to 5 revolutions per minute, while cross feed of the saddle range in eight steps from 0.0025 to 0.0125-inch per revolution of the tables. Thus rates of speed and feed can be suited to material cut, depth of cut, type and size of cutter and degree of accuracy and finish demanded. Incidentally, the attachment can be removed from the machine to permit its use as a regular tool and die miller.

Fig. 5—Metal blocks in foreground are "masters" which guide tools for milling the steel drop forge dies in background. These dies are used to forge cutting ends of auger bits



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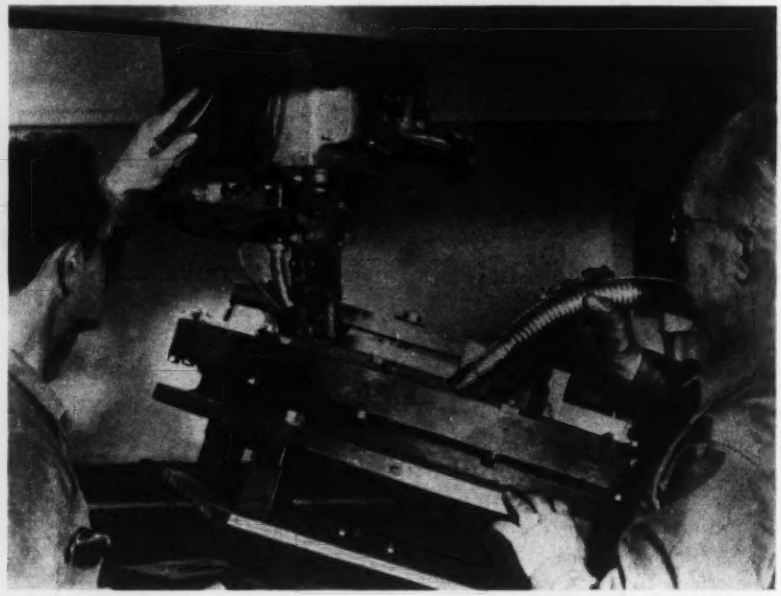


WELDS RAPIDLY: In order to fabricate J47 turbo-jet components at high production speed and with welds of uniform quality, Solar Aircraft Co., San Diego, Calif., turned to using automatic hidden arc welding. Parts made of 18-8 stainless are processed with a standard head made by Lincoln Electric Co., Cleveland, using 18-8 type filler wire. Rigidly controlled high heat inputs and rigid fixtures are said to maintain accurate parts alignment. Fixture is mounted on a rotating positioner which revolves the work under the welding head

In order that the cutter can do its work without having its shank interfere, it is necessary in many cases to tilt the cutter in relation to the work. That is the case in the setup shown in Fig. 1. To make this possible, the machine is designed so that its spindle carrier can be swiveled up to 15 degrees to the front and up to 35 degrees to the rear. This permits the cutter to get to the very bottom in deep decorative designs.

Square-Ended Tools No Problem—This tilting principle is further illustrated by the diagrams, Fig. 2, showing schematic relationships between tracers and masters. In case of the upper diagram, in which the master is represented by the crystal of a pocket watch, it is apparent that a square ended tracer—and a square ended tool—operating in vertical position, will function on a rotary table job without interference.

In the case of the doll's head, however, it is evident that to get at the various surfaces the tracer and the tool must be tilted as shown. Incidentally, this doll's head represents an actual job which was accomplished at one setting of the work by the reciprocating method of cutting. This job is illustrated by Fig. 3, in which the detail at the right is a master pattern made of easily worked composition cement, while the detail at the left is a steel hob cut in the die miller under guidance of this cement master. The hob in turn was used for forming dies in which plastic doll's heads are molded.

Finger Has Light "Touch"—As already mentioned, this steel hob was formed by the reciprocating method—half the contour being milled with the head swiveled to the rear and the other half with the head swiveled to the front. Masters made of composition cement, wood and other comparatively soft materials are entirely practical inasmuch as the pressure of the tracing finger on the master is extremely light.

The almost unlimited possibilities of master controlled mechanical die sinking in connection with mass production are indicated by Fig. 4 and 5, the first being related to the food industries—the second to woodworking tools. In the case of Fig. 4, we have at the right a steel master which was made under control of a former which in turn was molded from actual "hand dipped" chocolates.

At the left is a punch press die cut in the die milling machine under guidance of the steel former—the reciprocating method being used. This punch press die in turn is used in quantity production of sheet metal molds used in candy factories for quantity molding of chocolate candies which look exactly like those slowly produced by the old-fashioned hand method.

Hand Finishing Minimized—In Fig. 5, the blocks in the foreground are the masters from which the "upper and lower" dies in the background were master formed. These are drop forging dies used in mass production of auger bits—impressions at the outer side of these blocks being for the preliminary "strikes" and those at the inner side being for the secondary strikes. These illustrations indicate how little hand finishing was necessary after the machine cutting.

They also give a good idea of what a tremendous amount of chipping and filing would be required—and what great skill would be called for—if these comparatively small and simple jobs had to be "sculptured" out of solid blocks of steel by hand. Obviously, cost of the "handicraft" method today would be prohibitive even if diesinkers with skill and patience to do this work could be found.

High Output Power Plant

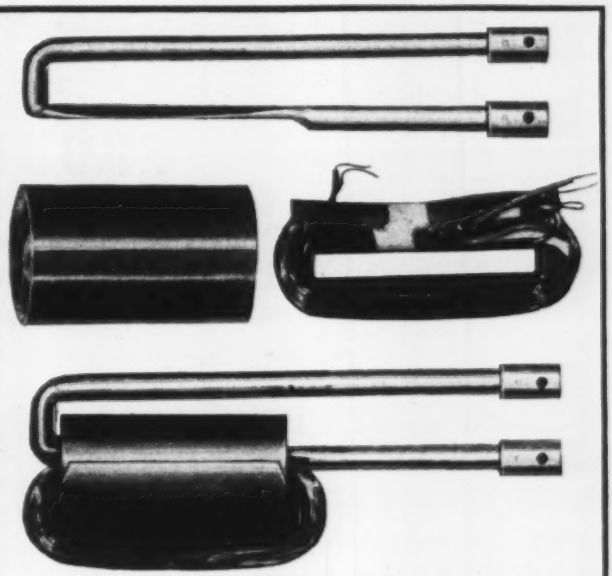
A diesel driven generator and six standard motor generator direct current welding sets comprise a power plant for arc welders recently designed. Built by McDowell Co. Inc., Cleveland, and incorporating welding sets made by Lincoln Electric Co., also in Cleveland, the welders and power unit are built into a special sled which may be transported to the job and which can be rolled on pipe if necessary.

Said to be an economical source of power for electric drive arc welders, the unit has a UD24 international diesel engine which drives a 100KW generator producing 220 or 440 v, 3 phase, 60 cycle power. Generator is said to have a capacity sufficient to operate the six 300 amp welders simultaneously, with adequate reserve to run eight welders if necessary. The two diesel units consume about 52 gallons of fuel oil per day, resulting in a power cost of 1 cent per kilowatt.

Can't Lose Instructions

To eliminate loss of vital installation and maintenance instructions on a new line of thermostats, General Controls Corp., Glendale, Calif., is making use of pressure-sensitive Kum-Kleen labels, developed by Avery Adhesive Label Corp., Monrovia, Calif. Labels to permit placing of instructions where they are needed; they remain in place as long as they are needed. Applied with finger-tip pressure, they are said to stick without curling through extremes of heat and humidity.

HEAVY, LESS EFFICIENT and slower to assemble, was the original Weller Soldering Gun composed of the parts shown. Compare these with the fewer parts at right in the new Gun, and you'll readily see why the new streamlined Weller is so popular.



THE NEW WELLER SOLDERING GUN handles 250 watts; heats, ready for use, in five seconds; has longer range to get into the tight spots, and is equipped with spot light. Uses current only when trigger is operated. It is assembled faster. Requires no bolts or nuts. The ⅜" Revere Copper Rod that replaces the secondary coil in the transformer is sheared, flattened, and bent at right angles in a 200-ton press in a single operation.

COPPER TREATS YOUR PRODUCT BETTER WHEN YOU

Control Your Temper

Revere Copper Rod replaces Secondary Coil in Soldering Gun Transformer . . . reduces number of parts, makes for a speedier, more efficient assembly . . . also makes possible a lighter, more compact unit of increased capacity.

WHEN the Weller Manufacturing Company, Easton, Pa., was completing the development of its new electric soldering gun, they were confronted with this problem: The ⅜" Revere Copper Rod used to replace the secondary coil in the transformer had to maintain its rigidity yet be sufficiently soft so that during the shearing, coining, and bending operations there would be no breaking or splitting of the rod.

Revere's Technical Advisory Service recommended a certain temper copper rod. It was discovered that Weller was getting a twist in the rod when it was installed in the assembled gun. Other tempers were tried and tested. Then a copper rod of a slightly harder temper than the first was recommended. That was it! Proper temper was the key. Proper temper was also the key to the .291 dia. copper rod used for the Soldering tip itself. For this, too, had to retain its rigidity and yet remain soft enough to be coined, punched, and formed without fracture.

"In addition to being extremely helpful in arriving at the proper tempers, Revere also recommended that we specify our rod in multiple lengths, and thus save considerably on scrap. They were also helpful in solving the problem of attaching the brass sleeve to the secondary rod in our Soldering Gun," the Weller Manufacturing Company tells us.

So you see, Revere's interest in your problem does not stop with the recommendation of its products. Perhaps Revere can help you. Why not take your current problem to the nearest Revere Sales Office and see?

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FUNDAMENTALS of STEELMAKING

NUMBER 27 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

PRODUCTION OF BARS

Contrary to popular notion, bar mills are not confined to the production of bars only. Products such as rods, billets, slabs, plates, skelp and other material may all be rolled on a bar mill

By C. W. BARRETT
Chairman of the Bar Mill Committee
and
Chief Roll Engineer
Republic Steel Corp.
Cleveland

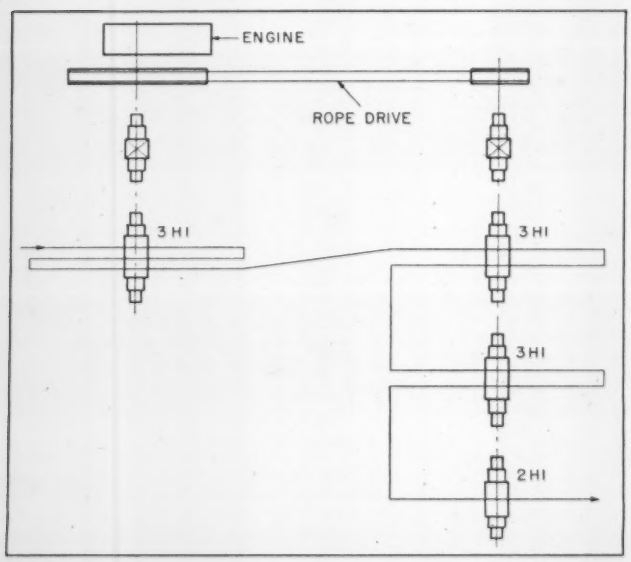
PART I

WHILE bar mills are generally thought of as small mills rolling light material, their products include a range of foot weights exceeded only on the light side by a few hoop sizes and on the heavy side by the product of large universal beam mills.

Thus the bar mills have always been general purpose mills, rolling a diversity of shapes, sizes and quality of products, and their development has been governed by the need to preserve enough flexibility to meet these conditions.

To touch briefly on the history of merchant bar mills we find that as early as 1783 a simple mill consisting of one stand employing two plain rolls was used for rolling flat products. This unit was driven by a water wheel and in this type of mill it was necessary to pass the bar back over the stand to get back to the entering side of the mill—a very slow procedure. This mill was confined to short products and its output was low.

Fig. 1—While of German origin this mill was an improvement over the original three-high bar mill due to the addition of a separately driven three-high stand for roughing purposes

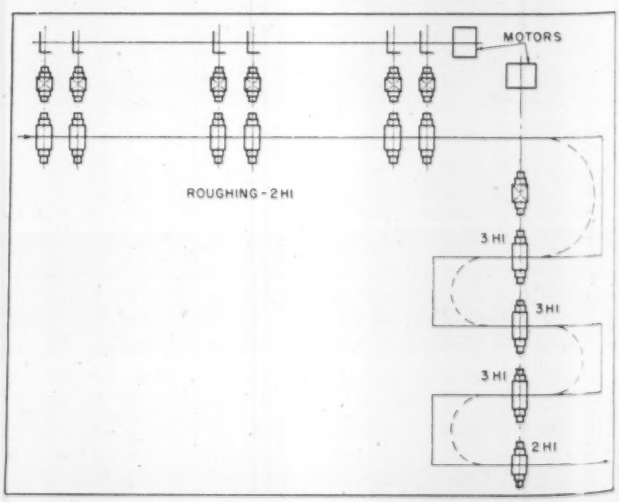


Due to wasted time and heat loss incurred on a mill of this type, around the year 1800, someone conceived the idea of placing three rolls in one stand to avoid the idle pass. This started with a single stand but soon additional stands were added to the same drive which made a more flexible mill, producing longer lengths from larger billets. This was a major improvement over the two-high mills.

The Belgian mill was an improvement over the original three-high mill, in that it had an additional separately driven three-high stand for roughing purposes. This mill was of German origin and is shown in Fig. 1.

With the separate roughing stand, the roughing passes could be made at slow speeds, while the finishing train speed was increased. As a result, output was increased and longer lengths could be rolled. This was the production mill for small bar sizes in America prior to about 1900. Although the idea has been carried much further by the use of additional roughing and finishing trains for the rolling

Fig. 2—This variation of the semicontinuous roughing and three-high finishing utilizes separate motors to drive the roughing stands independently or in small groups to secure desired rolling flexibility



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of rod and hoop, the Garret rod mill represents the ultimate development of this type of layout.

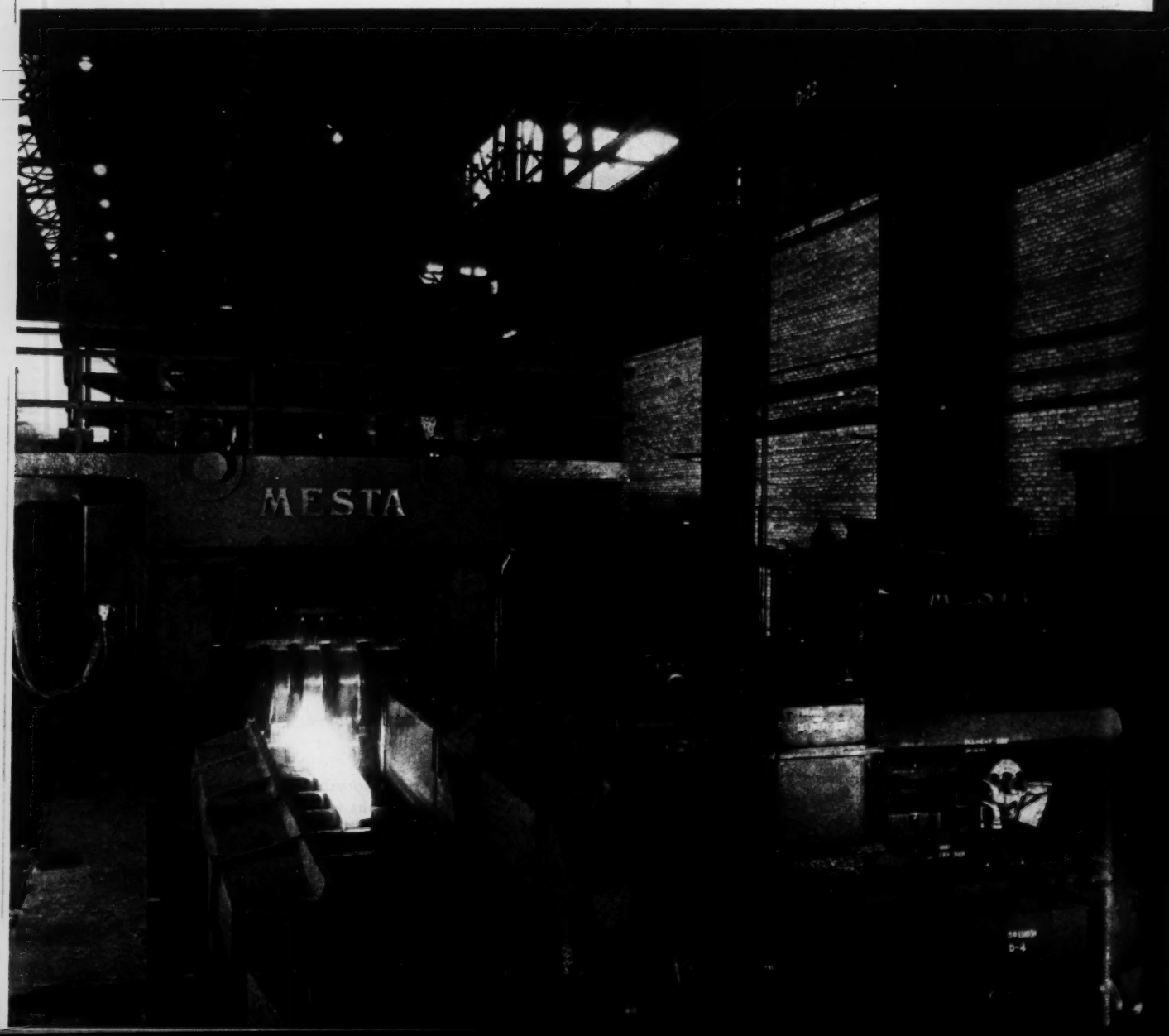
Like the three-high hand mill, the Belgian hand mill is outmoded in American practice and is gradually disappearing as a major producing unit except for the production of special steels or common bars in localized market areas. Partially mechanized with tables and transfers, these mills are a stopgap between the three-high hand mills and modern semicontinuous mills.

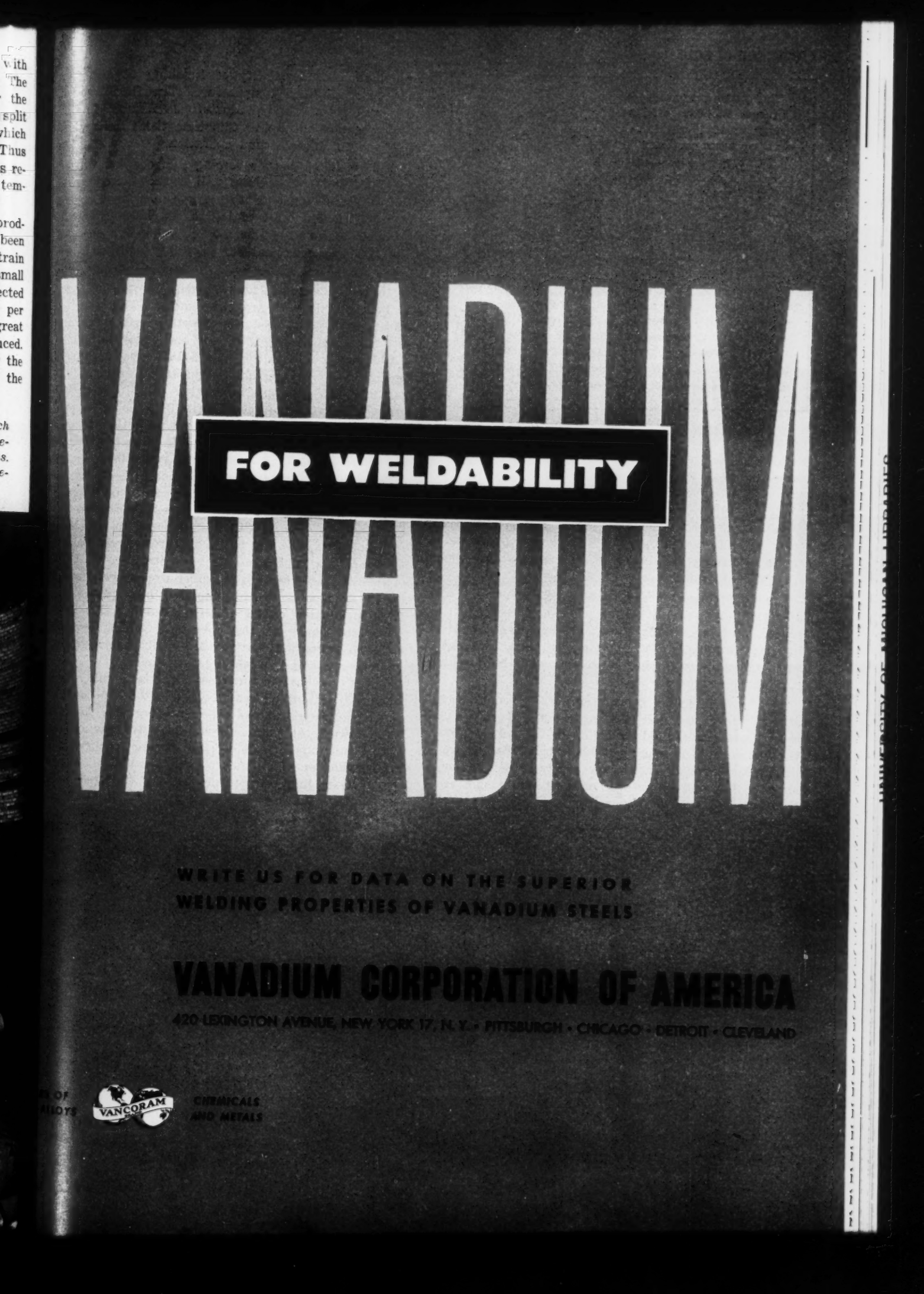
Fig. 2 shows the plan of a mill with semicontinuous roughing and three-high finishing. Early mills of this type had six or more closely coupled gear driven continuous stands and it was difficult to obtain the variety of sizes needed from the roughing mill to cover the flexible range of finished product. This was overcome by breaking the roughing mill into units of one to four stands, with the bar running free or looping between. Various arrangements of this sort were installed but at best it was difficult to obtain the flexibility needed. In the latest mills, speed variation has been sought by use of separate motors to drive the roughing stands independently or in small groups.

Layout of a semicontinuous roughing mill with a two-high finishing train is shown in Fig. 4. The two-high finishing train has advantages over the three-high in rigidity, also in the ability to split up the finishing stands into smaller groups which can be driven at successively higher speeds. Thus the length of loop which runs out on the floor is reduced, output is increased and a higher finishing temperature maintained.

As a means of producing lighter foot-weight products at a greater finishing speed, stands have been added to delivery end of the two high finishing train as shown in Fig. 5. This type of mill produces small rods up to 4200 feet per minute and it is expected that finishing speeds will soon reach 5500 feet per minute. Flexibility of this kind of mill is very great and a variety of products and sizes can be produced. With the use of mechanical repeaters to convey the bars from stand to stand in the looping train, the

Fig. 3—Billets are roughed down on this 36-inch mill and then moved on to a three-stand 32-inch reversing mill which finishes them in to bar sections. This installation is one of the largest and most recent made within the United States

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The author graduated from Carnegie Institute of Technology in 1927 and for the next two years was employed by Carnegie-Illinois Steel Corp. as a draftsman. Next he was employed as roll designer for Pittsburgh Rolls Corp. and remained there until 1938 when he moved to Dominion Steel & Coal Corp., Sydney, Nova Scotia, as roll designer and superintendent of roll shops. In 1943 he accepted a position with Republic Steel Corp. as roll designer and superintendent of roll shops in the Chicago district. After completion of the DPC project he was made chief roll engineer and two years ago he was moved to Cleveland as chairman of the Bar Mill Committee.

operation of such a mill becomes very economical.

Fig. 6 shows a cross country mill which is quite common in the larger bar mills, 12 inches and up in size. It may have continuous or semicontinuous roughing followed by finishing stands spread out in a manner to permit the handling of material to and from the roll stands by roller tables with provisions for transferring the bars laterally across the mill from stand to stand.

Products rolled on these mills are generally of a heavier foot-weight than can be looped or repeated. For large mills (20 inches and up) a three-high roughing stand was commonly used, although some mills up to 28 inches in size were built with continuous roughers.

The most recent installation of a continuous straight away bar mill is shown in Fig. 7. Each of the stands has individual motor drive and employs the use of vertical edgers which is beneficial in producing flat products and some of the more common shapes. Some advantages of mills of this design are the increased tons per hour over the older types of mills, and the feasibility of finishing at a hotter and more uniform temperature. The flexibility of this mill permits the product to be finished in different stands but up to this time these mills were confined to single strand operation.

A 32-inch two-high reversing mill coupled with a two-high 36-inch roughing mill is shown in Figs. 3 and 8. This is one of the larger and most recent installation. This sort of mill has a large range of products and was engineered for quick size changes and affords mechanical bar handling facilities.

Fig. 9 shows still another of the larger type mills of three-high design usually consisting of from three to four stands with traveling tables. This type of mill is commonly used for structural sections, rails and tie plate, also large rounds and square products.

Blooms or billets are the semifinished products furnished by the blooming and billet mills to the bar mill for additional reduction into finished bar products. After the bloom or billet has been produced on the primary mills, it is permitted to cool to atmospheric temperature. In the case of some of the more critical alloy steels, a controlled cooling cycle must be followed. At this point the billets or blooms are ready for inspection and conditioning prior to being charged into the reheating furnace for rerolling into bar products. Some of the steels at this point require 100 per cent surface removal before rerolling, others require very little.

Steel is then moved to the billet storage yard where billets or blooms are accumulated into grades and sizes in advance of the rolling schedule. This is an important phase of the operations which requires close co-ordination between the mill superintendent and the order and scheduling departments.

Types of reheating furnaces vary considerably from the most antiquated sand bottom batch type unit to the modern (continuous type) regenerative furnace.

The two most common fuels used are gas and oil with gas having the preference. In most localities gas is the cheaper and requires little mechanical equipment other than burners to render the fuel in a combustable state.

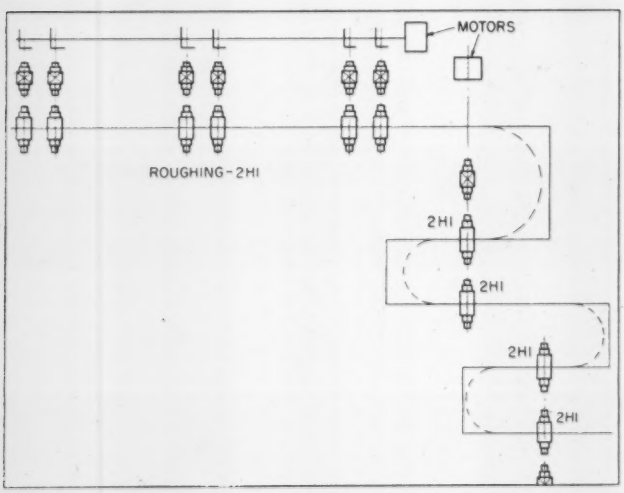

Fig. 4—The two-high finishing train in this mill layout offers advantages in rigidity and higher delivery speeds. Thus, output is increased and a higher and more uniform finishing temperature secured

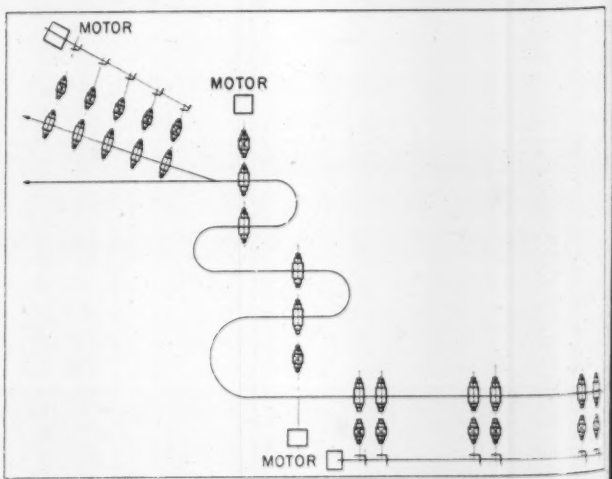

Fig. 5—Additional two-high stands added to the finishing end of this layout enables the faster finishing of lighter foot-weight bars. This type mill rolls small rods at a speed of 4200 feet per minute

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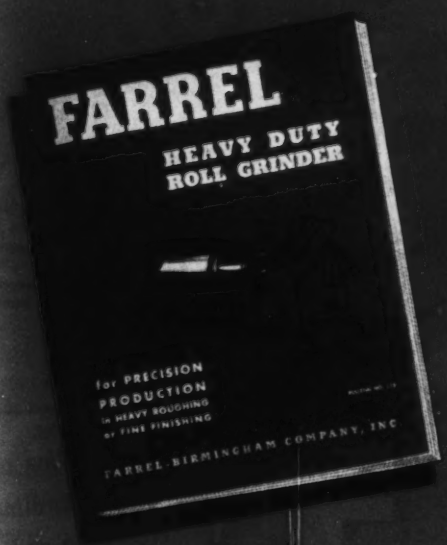

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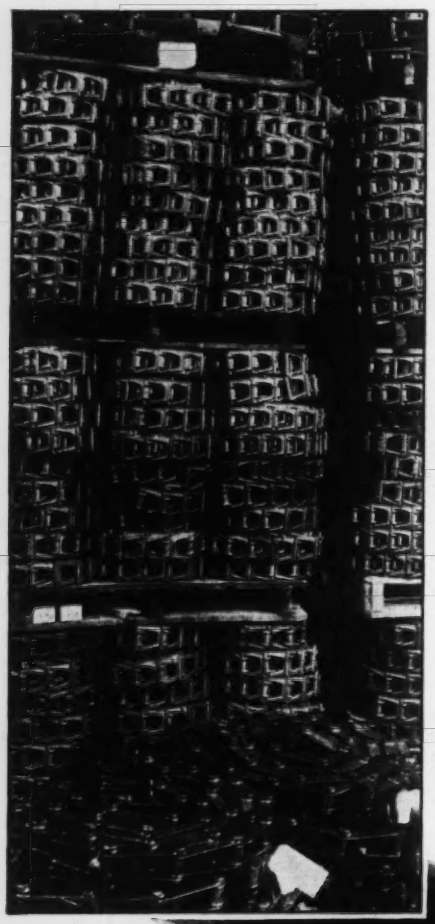

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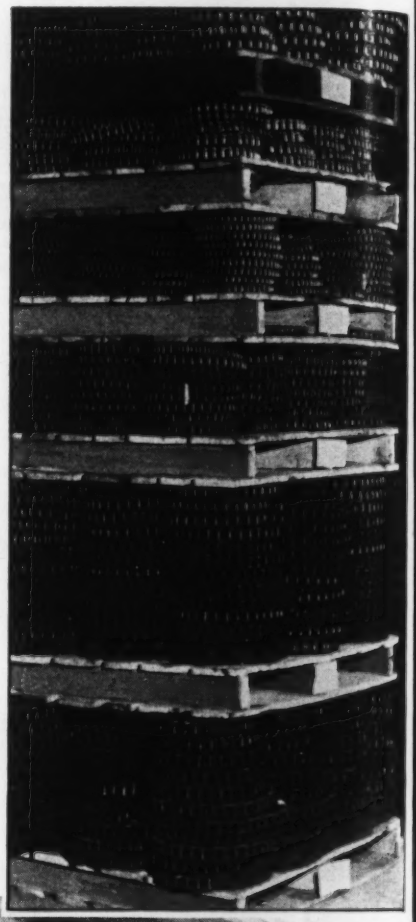

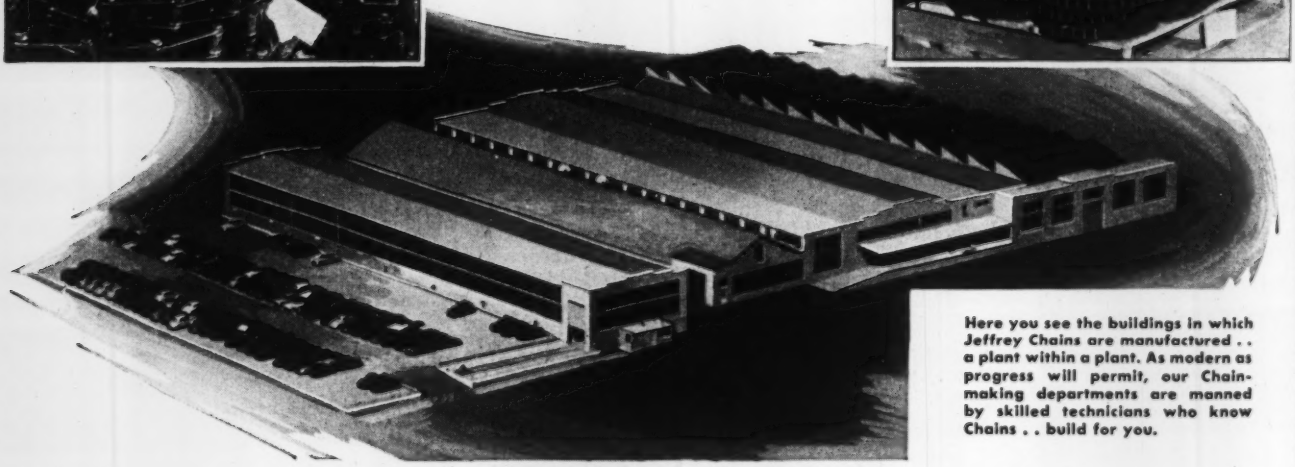

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Modern reheating furnaces have capacities of over 100 tons per hour and on some of the lighter bloom and billet sizes a fuel consumption of 1,500,000 Btu's per ton is not uncommon when using gas for fuel. Most of the furnaces on the smaller bar mills are built to take 30-foot billets while furnaces supplying larger mills usually are not built to handle that length of semifinished material.

Furnace temperatures vary from about 1800 to 2400° F and are controllable, depending directly on the characteristics of the steel being heated.

From here the hot billets are delivered to the bar mill for further reduction into finished bar products.

Actual rolling practice varies with the type of mill, product being produced, size of available blooms or billets, furnace capacity, mill horse-power, table length, mill size and numerous other variables, and it must readily be understood there can be no set rule to produce any given product.

The billets are delivered to the mills from the reheating furnace as quickly as possible to retain their heat. The rolls would become quite hot from this operation and soon break were they not water cooled. Limits must be placed on the amount of water used to cool a pass. Too much water may mean a short pass life. Roll analysis falls into two divisions, steel and iron, with many modifications of each being produced. After the rolls become worn and roughed-up, they are returned to the roll shop and remachined for further use.

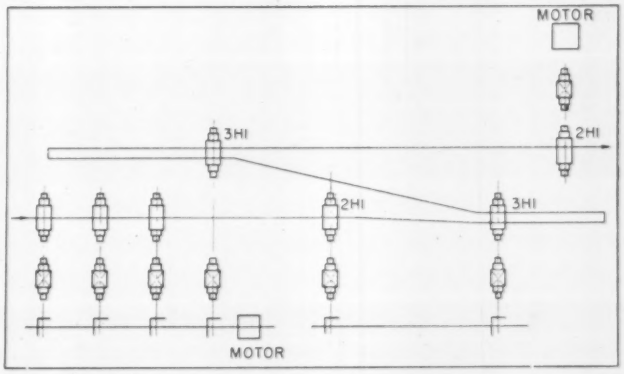

Fig. 6—Plan of a cross-country type mill which is quite common in the larger bar mill sizes of 12 inches and up. Finishing stands usually spread out in a manner to permit handling of material to and from the roll stands by approach and delivery roller tables

Leaving the rolling end, hot bar products usually pass over a motor driven roller table on their way to the cooling beds, where they are held for a sufficient period of time in order of facilitate their cooling. Fig. 10 shows the more common type of cooling bed for the larger mills. This also is a very important phase in the production of bars. During this time the bars are held as straight as possible to eliminate the necessity of any machine straightening after shearing.

On leaving the cooling bed, the bars are sheared or sawed to length and bundled. Some products are shipped directly to the customer while others may require further conditioning, such as removal of surface defects, pickling, oiling, straightening, etc.

Some of the light foot-weight bar and rod products are produced in coils which vary from 150 to over 600 pounds, depending on the customer's requirements. Here again the size of billet the mill and furnace can handle governs the condition. Both products are commonly double stranded and on the Garrett type rod mill, as many as seven strands are finished simultaneously in the same set of rolls, after which the product is coiled.

It must be remembered that the term bar mill does not limit the mill to producing bars only. Products such as rods, billets, slabs, plates, skelp, etc., may all be produced on a bar mill.

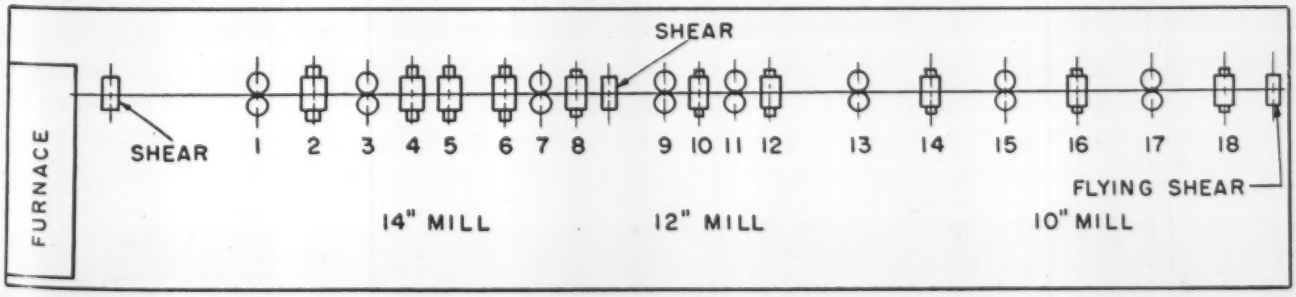

Fig. 7—This continuous straight away bar mill utilizes individual motor drive and employs vertical edgers which offer many advantages in the rolling of flat products and some common shapes

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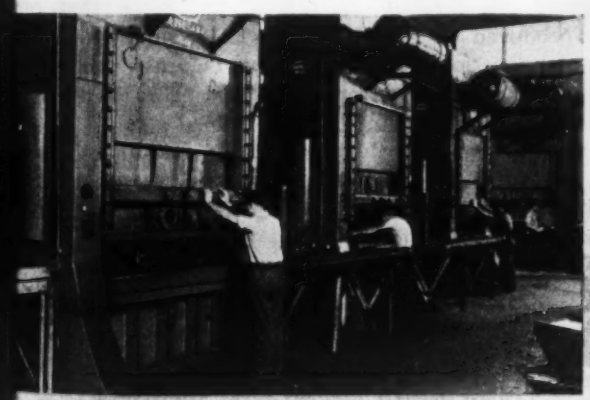

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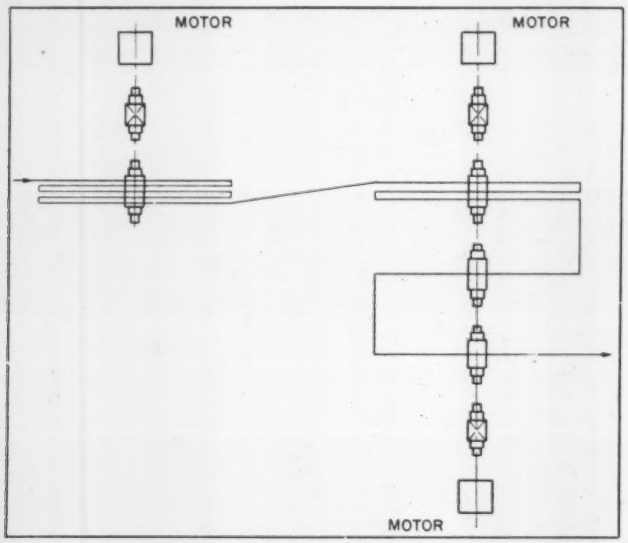

Fig. 8—This layout utilizing a two-high 36-inch roughing stand coupled with a two-high 32-inch reversing mill affords a large range of products and was engineered for quick size changes. Its mechanical bar handling facilities eliminate much manual labor associated with bar mill rolling practice

Merchant bars as governed by American Iron and Steel Institute standards cover the following products listed here:

Rounds ¼-inch diameter to 8¼-inch diameter inclusive
Square ¼-inch diameter to 5½-inch diameter inclusive
Round cornered squares ⅜ to 8-inches inclusive
Hexagons ¼ to 4 1/16-inches
Flats 12/64-inches and over in thickness and up to 6 inches in width

While this size range is generally true, there is considerable variation of sizes in the top range, for instance, rounds up to 9¾ inches in diameter are being produced on bar mills at the present time. This is governed by the equipment available in the different producer's plants.

Size classifications of bar mills vary from 8 to 34 inches inclusive and depend on the diversification of product requirements. The size commonly spoken of as mill size on bar mills is the pitch diameter of the driving pinions.

The pitch diameter of new rolls is usually greater

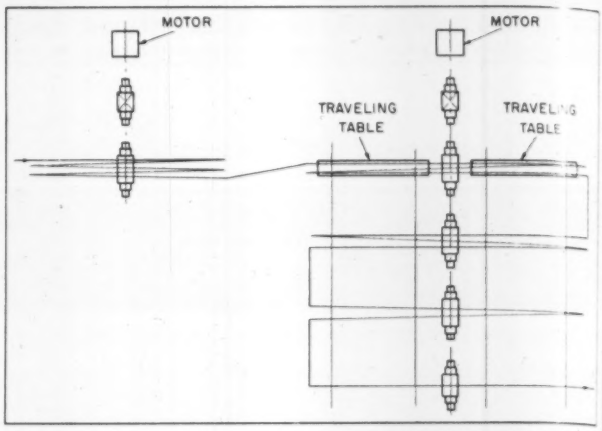

Fig. 9—This larger mill of three-high design is most commonly used for the rolling of structural sections, rails and tie plate, large rounds and square products. Note travelling table for moving partially rolled sections

than the pitch diameter of the pinions, which allows the rolls to be dressed or (remachined) several times before they are scrapped.

Amount of variation in diameter of rolls above and below the pitch of the mill pinions is governed by size of the mill, distance between stands, roll breakage, location of rest bars, guide equipment and physical characteristics of the mill housings.

The size range of products in relation to mill sizes for the common bar products is shown in Table I. The trend on all bar mills in the past has been to increase the bar size range which generally reduces costs through increased tons per hour. This table gives a comparison of present day practice.

The top range of sizes cannot be applied to all mills as the size of the roughing and breakdown stands are directly related to the sizes that can be produced on the finishing stand and likewise the lighter sections are dependent on the number of passes that can be employed, thus there is no fixed rule that will apply in all cases.

One of the desirable features to be adhered to in bar mill practice is to produce the finished product from as large a billet or bloom as possible after conditioning. This tends to afford better surface

TABLE I
PRODUCT SIZE RANGE IN RELATION TO MILL SIZES

Pinion Diameter of Fin. Stand In Inches	Bloom & Billet Sizes Entering Mill In Inches	Rounds Inches	Squares Inches	Flats Inches	Angles Inches	Hexagon Inches	Miscellaneous
8	1½–2⅜ square	0.220–⅞	¼ to ⅞	⅝ x ⅛	½ x ½ x ⅛ 1½ x 1½ x ¼	5/16 to 13/16	Window Sash Sections
10	1½–4 square	⅜–1½	25/64 to 1⅜	1 x 1/16 3½ x ½	½ x ½ x ⅛ 2½ x 2½	⅜ to 1⅜	Window Sash Sections
12	3 to 6⅜ square	7/16–3½	13/16 to 3½	1¾ x ⅜ 7 x 1[a]	¾ x ¾ x ⅛ to 4 x 4	¾ to 3	Window Sash Sections
14	4 to 7½ square	1¼–4½	1⅛ to 4	3½ x ¼ to 8 x 1[a]	2 x 2 5 x 5	1¼ x 4	
18	6 to 10½	1¾–6¼	1¾–5¾	2¼ x ¾ 10 x 2	3 x 3 6 x 6		Structural Shapes
24	6 to 12	3–8½	2¾ to 8		3 x 3 8 x 8		Structural Shapes
32	7½ x 7½ to 13 x 15	3–10	2¾ to 8				Structural Shapes

Note: *a* Considered as plates.

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TABLE II

SIZE TOLERANCE LIMITS FOR ROUNDS AND SQUARES AND ROUND-CORNERED SQUARES

(All figures in inches)

Specified Sizes	Variations from size		Out-of-Round or Out-of-Square Section
	Over	Under	
To 5/16 incl.	0.005	0.005	0.008
Over 5/16 to 7/16 incl.	0.006	0.006	0.009
Over 7/16 to 7/8 incl.	0.007	0.007	0.010
Over 7/8 to 1 incl.	0.008	0.008	0.012
Over 1 to 1 1/8 incl.	0.009	0.009	0.013
Over 1 1/8 to 1 1/4 incl.	0.010	0.010	0.015
Over 1 1/4 to 1 3/8 incl.	0.011	0.011	0.016
Over 1 3/8 to 1 1/2 incl.	0.012	0.012	0.018
Over 1 1/2 to 2 incl.	0.014	0.014	0.021
Over 2 to 2 1/2 incl.	1/64	1/64	0.023
Over 2 1/2 to 3 1/2 incl.	3/32	0	0.023
Over 3 1/2 to 4 1/2 incl.	3/64	0	0.035
Over 4 1/2 to 5 1/2 incl.	1/16	0	0.046
Over 5 1/2 to 6 1/2 incl.	5/64	0	0.058
Over 6 1/2 to 8 1/4 incl.	7/64	0	0.070
	1/8	0	0.085
	5/32	0	

Note: Out-of-round is the difference between the maximum and minimum diameters of the bar, measured at the same cross section. Out-of-square section is the difference in the two dimensions at the same cross section of a square bar between opposite faces.

TABLE III

SIZE TOLERANCE LIMITS FOR HEXAGONS

(All figures in inches)

Specified Sizes between Opposite Sides	Variation from Size		Out of Hexagon Section
	Over	Under	
To 1/2 incl.	0.007	0.007	0.011
Over 1/2 to 1 incl.	0.010	0.010	0.015
Over 1 to 1 1/2 incl.	0.021	0.013	0.023
Over 1 1/2 to 2 incl.	1/32	1/64	1/32
Over 2 to 2 1/2 incl.	1/32	1/64	1/32
Over 2 1/2 to 3 1/2 incl.	1/16	1/64	1/16

Note: Out of hexagon section is the greatest difference between any two dimensions at the same cross section between opposite faces.

TABLE IV

SIZE TOLERANCE LIMITS FOR SQUARE-EDGE AND ROUND-EDGE FLATS

(All figures in inches)

Specified Widths	Variations from Thickness, for Thicknesses Given, Over and Under					Variations from Width	
	Under 1/4	1/4 to 1/2 Incl.	1/2 to 1, Incl.	Over 1 to 2 Incl.	Over 2	Over	Under
To 1 incl.	0.007	0.008	0.010	..	..	1/64	1/64
Over 1 to 2 incl.	0.007	0.012	0.015	3/32	..	1/32	1/32
Over 2 to 4 incl.	0.008	0.015	0.020	3/32	3/64	1/16	1/32
Over 4 to 6 incl.	0.009	0.015	0.020	3/32	1/16	3/32	1/16

quality and imperfections that might not have been removed at time of conditioning will become elongated and shallower with the greater amount of reduction.

Merchant carbon steel bars are classified into three distinct quality classification groups: Namely, merchant quality, special quality, and restricted requirements, this depending upon the end use of the product.

We generally consider blooms as having a cross sectional area of 36 square inches or greater. Rectangular products where the width is twice the thickness or greater and having a minimum cross section of 16 square inches are commonly called slabs. Products from 1½-inch squares to 6 x 6 inches for rerolling purposes are classed as billets and sold as such. Billets to the forgers have a minimum size of 4 x 4 inches and up to the extreme limitations of the mills. Products for forgers smaller than 4 x 4 inches are sold as bars. Again the classification may not be 100 per cent true as some manufacturers may vary their practice.

Size tolerance limits as established through the American Iron and Steel Institute in conjunction with the steel producers have proven to be worth-while guides to industry as well as to purchasers. Establishment of these standards has been influential in providing for a universal product.

Industry requires that bars specified commercially straight do not exceed ¼-inch in any 5 feet of out of straightness. Bars specified for special straightness must be within ⅛-inch in any 5 feet. Examples of standard specifications are presented in Tables II, III, and IV.

(To be concluded)

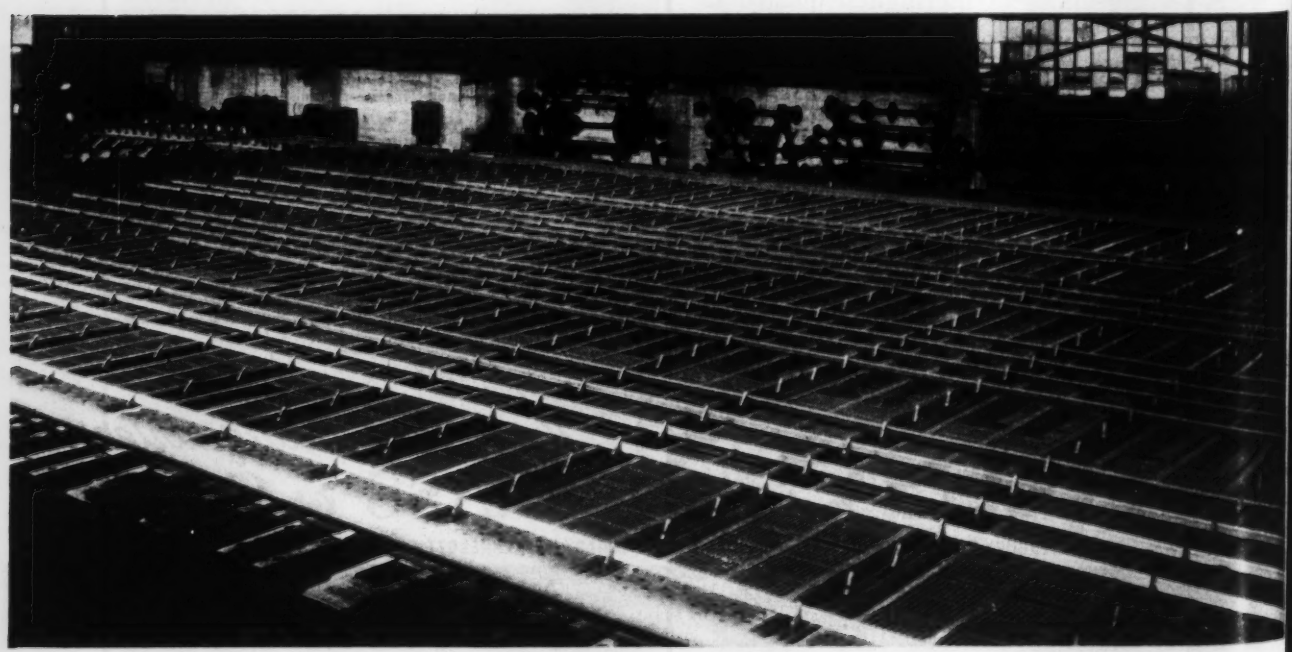
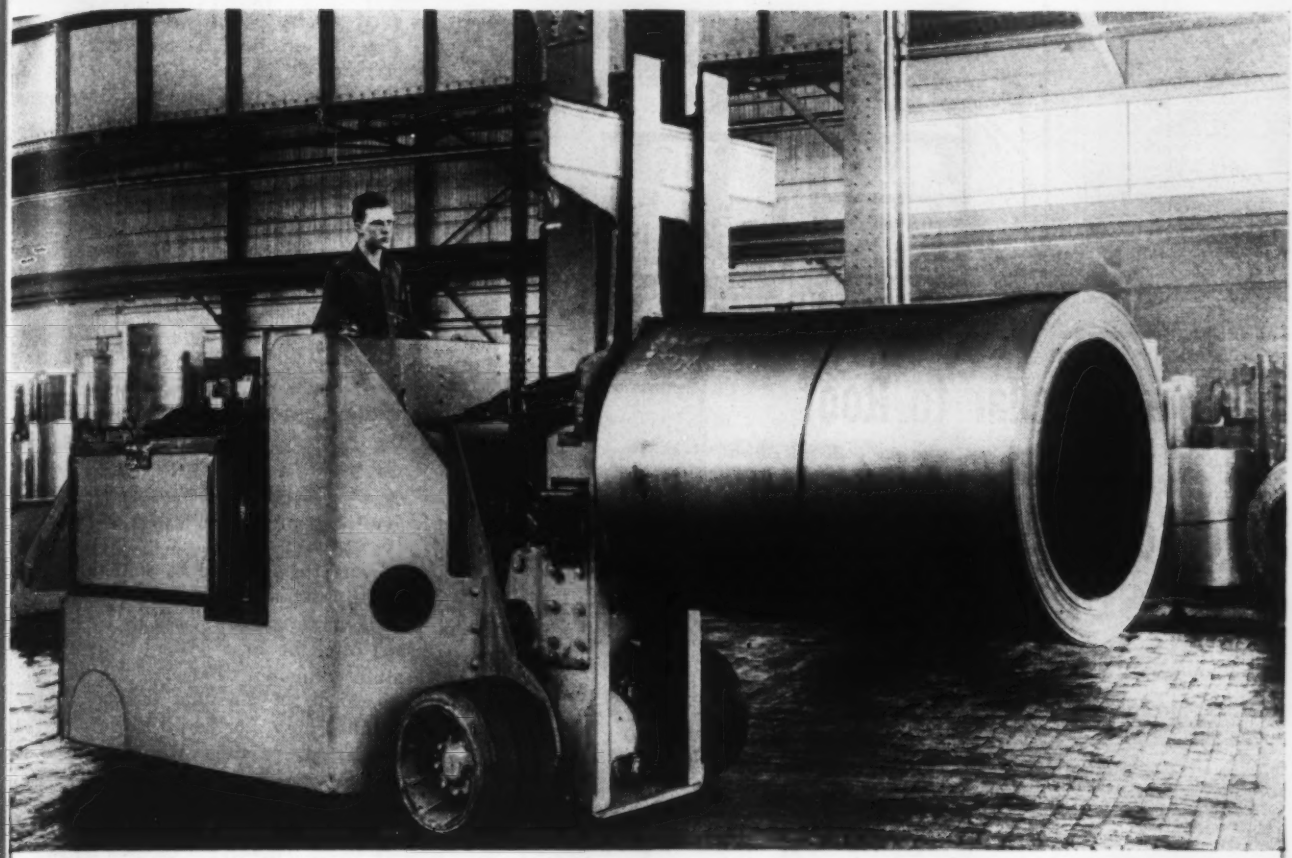


Fig. 10—View of a single dragover-type cooling bed which is generally used in the larger mills. This operation is most important in the production of bar products. During cooling time the bars are held as straight as possible to eliminate the necessity of any machine straightening after shearing



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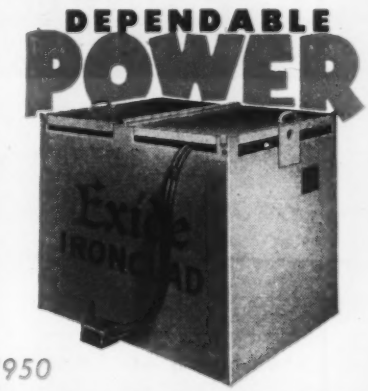

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Water-Cooled Engine Block

(*Concluded from Page 87*)

gressively as the mold is filled. The metal begins to solidify at the furthermost point from the furnace, and solidifies progressively toward the gate or furnace end. It is held in the tilted position long enough to solidify the casting and a small portion of the gate which at this time assumes the role of a riser. Upon the machine's return to horizontal position, the liquid portion of the gate is returned to the bath.

Die Heated to 400° F—In producing the cylinder block casting, the die was first heated to a temperature of 400° F, after which it was sprayed with a special preparation consisting of graphite, silica soda, and water. It was then heated to a temperature of approximately 750° F, preparatory to pouring the first casting.

From the first casting it was possible to detect that the die had not absorbed all the heat it was capable of absorbing, nor had it as yet reached a thermal balance which it must do before castings can be made. When the proper die temperature was reached, when the proper spray procedure was established, and when the casting cycle was adjusted to the progressive solidification of the casting, it was possible to pour one casting after another and proceed with the production of sample castings.

Operator Plays Important Role—The operator of the tilting machine plays an important part in gravity die casting. He co-ordinates the various operations of the die, the machine, the use of spray, etc. On each job a careful log is kept so that metal and mold temperatures are recorded, proper spray techniques followed and the pouring cycle adjusted to the specific requirements of the casting.

In its application of the Wessel system of gravity die casting of which it is one of the first licensees, the Progress plant works with both full permanent molds (metal dies and metal cores) and with semipermanent molds (either metal dies with sand cores or metal dies utilizing both metal and sand cores). Type of core is established by the requirements of the casting to be made.

Engine Test Appended

American Society for Testing Materials, Philadelphia, is announcing that the 1950 appendix to the ASTM manual of engine test methods for rating fuels is available. It is said to be useful only in connection with the 1948 manual, which is also available from the society.

Press Meets Specifications

Only five seconds will be required by a new high speed press for the forming of inner door panels for automobiles. Built by Clearing Machine Corp., Chicago, this HiProDraw press is said to realize a gain of 70 per cent or more in production speed, while retaining the actual drawing speed of conventional presses.

When placed in service by its new owner, the press will be equipped with automatic feed and unloader to enable it to produce continuously at the five-second rate. A mechanical double action press, it has a total capacity of 750 tons, of which 450 is on the inner or forming slide. The press measures 108 inches between housings and will draw and lift out a maximum of 14 inches. Blankholder stroke is 22 inches.

Power is furnished by one 75 hp motor driving through a single Tornadyne clutch and brake unit. The portable pushbutton control makes it practical for one man to operate the equipment safely. A new linkage arrangement which controls movement of the outer and inner slides was designed to permit more strokes per minute without tearing the sheet during drawing.

Now You Can Knurl by Hand

In a field where many thought the possibilities for improvement were extremely limited, Wade Tool Co. of Waltham, Mass., has developed a two-way tool for hand use, designed for easy knurling of long or slender work which would bend under normal knurling pressure.

The tool resembles both a micrometer and a small tubing cutter. Two of its knurls revolve on stationary centers at the back of the work, while the third knurl is adjusted by means of the screw handle. To operate, the adjustable knurl is backed off so that the tool may be placed over the work, then it is screwed into the work under great pressure by turning the handle.

The "two-way" tool, so called because it may be operated in a stationary position to make a narrow band of knurling or adjusted to travel along the work for continuous knurling, has a work diameter capacity of ¾-inch maximum and 3/32-inch minimum. Alloy tool steel knurls are available for either straight or diamond patterns, in four pitches.

The Effects of Low Temperatures

Covering the field of ferrous and nonferrous metals, plastics and rubbers is a symposium on effects of low temperatures on the properties of materials, originally presented at a meeting of American Society for Testing Materials, Philadelphia. Designated as special technical publication No. 78, the symposium includes four illustrated papers: Low temperature behavior of organic plastics; low temperature properties of elastomers; effects of subatmospheric temperatures on the properties of nonferrous metals; properties of weldments at low temperatures. Booklet is available from the society, 1916 Race St., Philadelphia 3, Pa., for $1.50.

Silver Alloy Cladding Cuts Brazing Costs

DEVELOPMENT expected to make possible considerable savings in time and labor in brazing operations has eliminated need for rings, washers and preformed special shapes of silver brazing alloy.

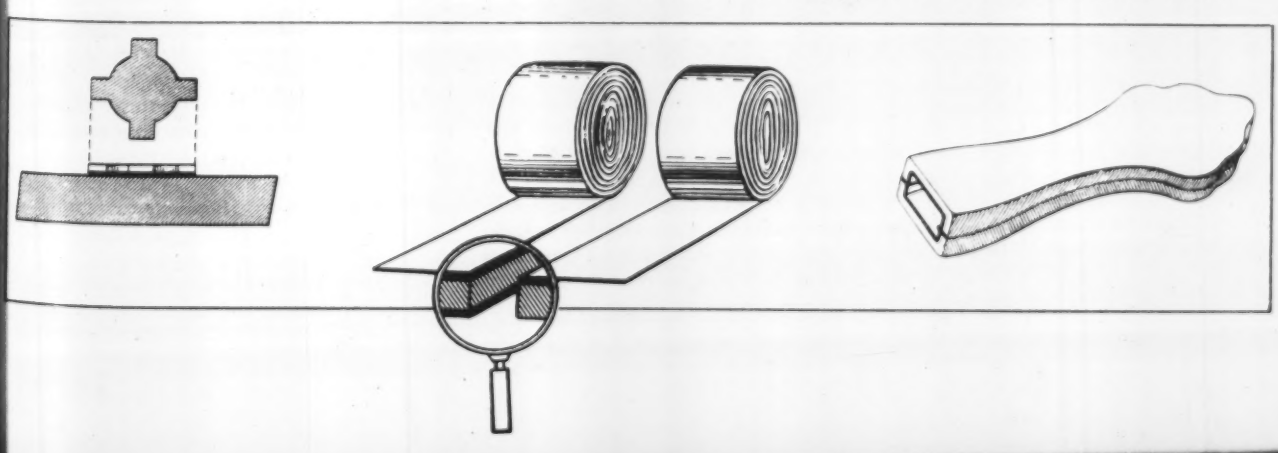
By making available most nonferrous metals in strip form, preclad on one or both sides with a layer of silver brazing alloy, Rolled Plate Division of American Silver Co. Inc., Flushing, N. Y., is passing these savings along to manufacturers of products incorporating hollow handles, hidden joints, seamed tubes and irregularly shaped parts, springs, studs, etc. Such materials as copper, most types of brass, nickel silver, jewelers' bronze, beryllium copper, cupro-nickel, nickel, Monel, etc., may be clad by the process, known as Braze-Clad.

Oxide Islands Bypassed — Silver brazing alloy is diffused into the parent metal at the supplier's plant and may be of any specified thickness and in any commercial melting range requested by the user. As the entire surface of the parent metal is prediffused with the brazing alloy, voids caused by dry spots and oxide islands are said to be eliminated.

Another advantage accruing from use of the clad-preplacement material is that longer and more uniform joints are possible, it not being necessary to rely upon capillary creep. Metals with the cladding may be blanked, stamped and drawn in the usual manner, regardless of whether they are clad on one side, both sides or in inlaid stripes. Reported to be extremely ductile, the alloy follows the contour of the forming dies, yet retains a specified bonding thickness.

Can Be Used in Furnaces—Recent developments in brazing techniques have allowed many assemblies to be processed by induction heating or furnace heating. According to the developer of this process, the Braze-Clad metals may be used in this manner by placing the parts to be joined in the proper position, fluxing and heating in the usual manner.

Brazing of such irregularly shaped parts as this stamping (left) and knife handle (right) is simplified by blanking silver alloy-clad metal. In center is magnification of Braze-Clad applied on one and both sides of metal



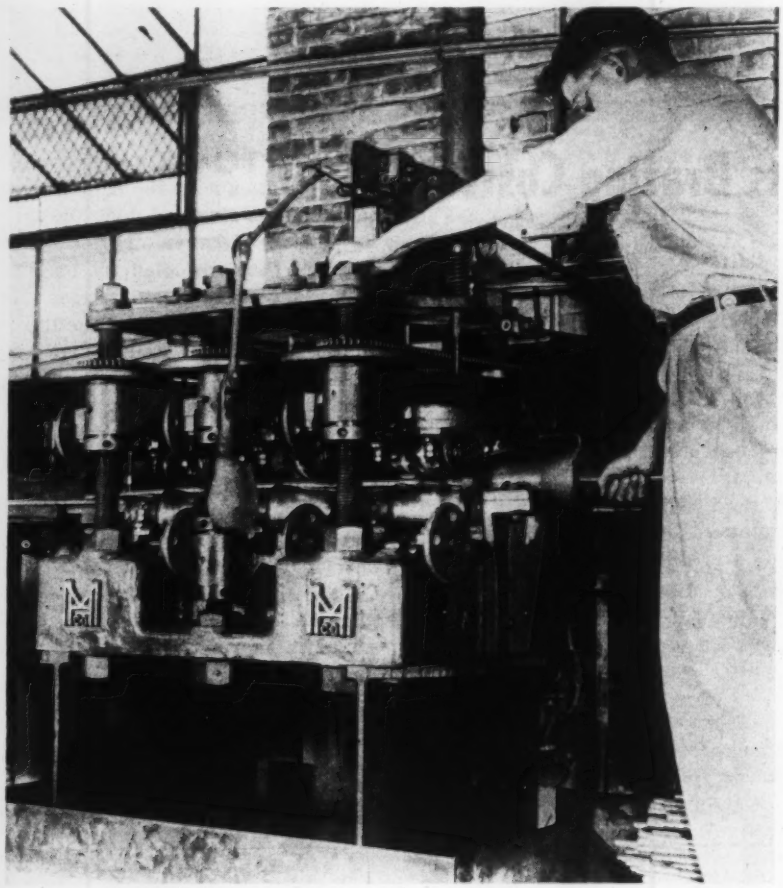
Harmony in Machine Color

Considerable reduction in the cost of finishes and finishing is expected to result from general acceptance of four accurately defined grays as standard finishes for industrial apparatus, machines and equipment. Adoption of these standard colors is announced by American Standards Association, New York, following a consensus reached by 18 organizations and groups representing all classes of manufacturers and users of such equipment.

The standard, Gray Finishes for Industrial Apparatus and Equipment and designated as ASA Z55.1-1950, is expected to be of further value to purchasers of equipment by making it possible to specify and to match grays and produce color harmony of machines and other equipment purchased from different manufacturers. Value of this simplification is illustrated by the experience of several electrical equipment manufacturers who have had to stock more than 100 different shades of gray to satisfy customers.

Each of the four grays may be specified by a name or a number. Although called light gray, medium light gray, medium dark gray and dark gray, they are not necessarily variations in proportions of black and white. They may be light or dark colors with low or weak chroma, less than 1.5. Actually light gray is a green, medium gray is a blue green, medium dark and dark grays are blues under the more discerning eye of a spectrophotometer, the basic instrument for identifying color.

Available from the association are copies of the standard and color ships of the standard grays for use as masters for inspection by a visual comparison method appended to the standard.



NO ARROW IS THIS STRAIGHT: Stainless steel, nickel and nickel-alloy seamless tubing may be straightened with a tolerance of 0.020-inch per foot after the last draw to specified size which gives it a "set" or "bow". Functioning in the Malvern, Pa., plant of J. Bishop & Co. platinum works, the rotary straightener has made it possible for this company to increase its output of tubing ranging in size from 1½-inches down to ¼-inch. Made by Mackintosh-Hemphill Co., Pittsburgh, the model AX machine operates over 11 hours in each 16-hour day with only minimum maintenance, at the same time assuring roundness and an unmarked tubing surface

Plastic Expects New Uses

Possessing high dielectric strength, good insulation resistance, excellent impact resistance and chemical inertness in Geon 400 X 65 polyvinyl chloride resin, announced by B. F. Goodrich Chemical Co., Cleveland. This type of plastic is unaffected by water, grease, oils, ozone, salts, alkalies, acids, oxidizing and reducing agents in fairly high concentrations and at relatively high temperatures. It is expected to be used in rigid sheet and piping, protective coatings and adhesives.

Circumvents Water Shortages

An increasing interest in dry type fluid coolers for industrial application due to shortages of water has lead Trane Co., La Crosse, Wis., to develop a line of 22 standard production units. Used for air-cooling engine jacket water and lubricating oil in diesel, gasoline and gas power plants, the coolers have also special applications in chemical and petroleum processing, metalworking and other industries.

Through combinations of coil circuits, one standard unit may dissipate heat from two or three different fluids, at different entering and elevating temperatures and different quantities of liquids. Capacities of the units range from 66,250 to 7,630,000 Btu per hour. Air flow varies from 2200 to 220,000 cfm and water flow, 20 to 1000 gallons per minute.

Issues Gray Iron Newsletter

To be distributed periodically to nonmember foundries to acquaint them with activities of the Gray Iron Founders' Society, is the *Gray Iron Newsette,* a one-page newsletter. It will outline items of information of interest to foundry executives and will keep nonmembers abreast of objectives and programs of the society, numerically the second largest manufacturing trade association in the country.

Manual Covers Fatigue Testing

Several years of work by American Society for Testing Materials committee E-9 on fatigue has culminated in a manual on fatigue testing, purpose of which is to supply information to those setting up new laboratory facilities, to aid in operating the equipment properly and to offer advice on presentation and interpretation of data. Identified as special technical publication No. 91,

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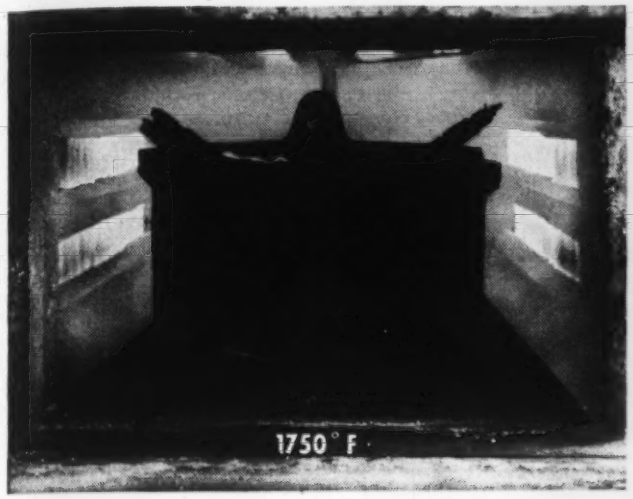

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Best of all, you can get *immediate* delivery of *Vega* in standard sizes from nearby Carpenter Warehouse or Distributor stocks. Start now to cut costs on jobs such as blanking, piercing, trimming and forming sheet metal in light and heavy gauges. For complete information and fast delivery, contact your Carpenter representative, today. THE CARPENTER STEEL CO., 139 W. BERN ST., READING, PA.

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it is profusely illustrated and contains eight sections.

Sections and their titles are: Introduction, symbols and nomenclature for fatigue testing, fatigue testing machines, specimens and their preparation, test procedure and technique, presentation of fatigue data, interpretation of fatigue data and a bibliography. Manual is available from the society, 1916 Race St., Philadelphia.

High Nickel Alloys Described

Properties of two high nickel alloys made by International Nickel Co. Inc., New York, are described in two 24-page technical bulletins recently issued. Containing charts, tables on compositions and properties, working instructions and other information of a technical nature, the revised bulletins have so much new data that they are said to be essentially new presentations.

Technical bulletin T7, entitled, "Engineering Properties of Inconel," also contains material on Inconel X, one of the newer age-hardenable nickel alloys. Bulletin T9 deals with engineering properties of K Monel and KR Monel.

Worn Tires Easily Replaced

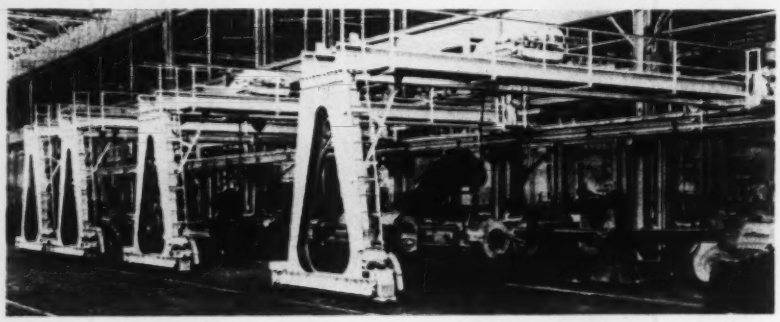
Production losses due to down time reportedly are reduced by an improved method of replacing cracked or worn metal tires on kilns, coolers and driers. Developed by Stroh Process Steel Co., Pittsburgh, the method makes use of a diagonally cored split tire which, by means of interlocking machined mating surfaces in the rim, can be positioned in the field without tearing out a section of a shell or disturbing the shell's existing alignment.

After positioning, the split is welded to make a full, solid ring which has no machined mating surfaces to loosen up under load and heat. It is said that the only machine work required, over and above that of a solid ring, is the planing of the interlocking machined mating surfaces of the rim.

It Drills, Reams, Bores, Taps

Time, frequently considered expendable, but always worth saving, is used in smaller quantities in setting and adjusting tools in a new machine for processing of transmission cases. Built by Cross Co., Detroit, the Transfer-matic machine drills, reams, bores and taps 48 holes with 84 tools at 15 stations. It is said that two workers operating at 80 per cent efficiency will produce 67 of the automatic transmission cases per hour.

One operator loads the parts on a pallet type fixture which is transferred from station to station by a hydraulically operated mechanism. Hydraulically operated shot pins and cam actuated clamps accurately locate pallets at each station. After the second operator has unloaded, the empty pallet is automatically returned to the loading station. Work cycle is automatically interrupted if critical tools are broken or improperly set for depth. Feature of the machine is a special bench and tool board on which are mounted two complete sets of preset tools and a set of tool-setting gages which are said to increase operating efficiency and reduce machine down time.



CRANES INTEGRATED WITH CRANES: Used as auxiliaries to overhead traveling cranes are these floor type gantry cranes in a rolling mill. Furnished by Northern Engineering Works, Detroit, the gantry equipment has been found to better co-ordinate the material handling facilities into an integrated handling process. Equipped with Hi-Lift trolley units, the newly installed cranes are equipped with roller bearings throughout, splash lubrication, hardened steel gears and mechanical and electric brakes

Has The Nose for It

Smooth and easy transfer of materials from inclined to horizontal conveyor units, or vice versa, is possible with a nosed-over delivery section offered on Rapistan Floor-Veyor Jr. permanently-mounted power belt conveyors. Made by Rapid-Standard Co., Grand Rapids, Mich., the conveyor's 10-inch long nosed-over section is set at an angle of 15 degrees from the plane of the straight bed, adding 3 inches to the pulley-to-pulley length of the conveyor unit. A standard cam-rack bracket permits attachment of a feeder section or a direct hook-up with a gravity conveyor line.

CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

Aug. 7-19, First U. S.-International Trade Fair: Coliseum, International Amphitheater and Navy Pier, Chicago. Fair headquarters are in Congress Hotel, Chicago.

Aug. 14-16, Society of Automotive Engineers: West coast meeting, Biltmore Hotel, Los Angeles. Society headquarters are located at 29 W. 39th St., New York 18.

Aug. 16-18, Third Western Packing and Materials Handling Exposition: Civic Auditorium, San Francisco. Additional information from Clapp & Poliak Inc., 341 Madison Ave., New York 17.

†**Aug. 28-31, American Mining Congress:** 1950 Metal Mining Convention and Exposition, Salt Lake City, Utah. Headquarters of AMC: Ring Bldg., Washington 6, D. C.

Sept. 5-9, American Chemical Society: National Chemical Exposition, Chicago Coliseum. Sponsored by Chicago Sections, ACS. 86 E. Randolph St., Chicago 1.

Sept. 11, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 11, Society of Automotive Engineers: Aeronautical meeting and aircraft engineering display, in Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15, Porcelain Enamel Institute: Twelfth Annual Forum, University of Illinois, Urbana, Ill. Institute is located at 1010 Vermont Ave., N. W., Washington 5, D. C.

Sept. 13-16, National Association of Foremen: 27th annual convention, Statler Hotel, Buffalo, N. Y. Association headquarters: 321 W. First St., Dayton 2, O.

Sept. 18-22, Instrument Society of America: Instrument conference and exhibit, Memorial Auditorium, Buffalo, N. Y. Society headquarters are at 921 Ridge Ave., Pittsburgh 12.

Sept. 19-21, American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Worcester, Mass. Society headquarters at 29 W. 39th St., New York 18.

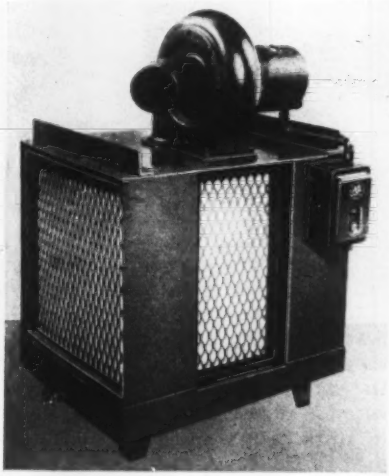
Sept. 23-26, Packaging Machinery Manufacturers Institute: 18th annual meeting, The Homestead, Hot Springs, Va., 342 Madison Ave., New York 17, is address of institute.

New Products and Equipment

Collects Oil Vapors

Particles of oil are removed from mist emanating around machines engaged in high speed operations where oil is used as a coolant by a motor-driven vapor collector, developed by Brown & Sharpe Mfg. Co., Providence 1, R. I. Attachment consists of a motor-driven fan mounted on a dispersing tank. Oil-laden air is blown into the tank where it disperses in an expansion chamber so that it slowly spreads over the whole area of the three outlet filters.

Oil is collected on the renewable filter pads where it drains to the base



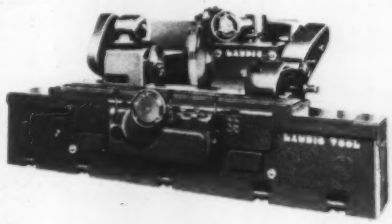
of the tank. Reclaimed oil can be piped directly to the coolant tank if desired. Provision is made for either setting the attachment on the floor or suspending it.

Check No. 1 on Reply Card for more Details

Plain Cylindrical Grinder

Features of a line of 10 and 14-inch plain and semiautomatic grinding machines, available from Landis Tool Co., Waynesboro, Pa., include heavy bed, new operating controls and lubrication methods, telescopic covers for carriage ways and 30-inch diameter grinding wheel driven by either a 10 or 15 hp motor. Lengths between centers are 18, 36, 48, 72, 96 and 120 inches in both 10 and 14-inch swings. Headstock is powered by a 1 hp motor, with four work speeds from 54 to 150 rpm.

Babbitt lined, steel backed, one-piece microsphere bearings support the grinding wheel spindle. Headstock spindles, wheel feed and hand traverse use antifriction bearings. Wheel feed handwheel can be operated as coarse or fine feed. Hydraulically operated slow grinding feed for traverse grinding operations feeds at each or either reversal point. For semiautomatic plunge grinding

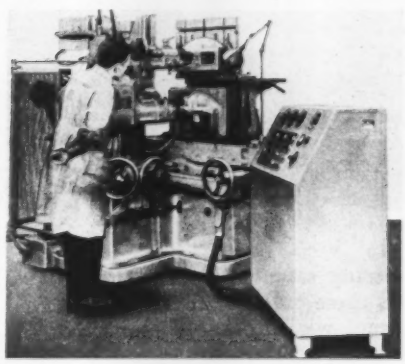


operations, a timer may be supplied so that operator only loads and unloads workpieces. Extra equipment is available for adapting machines to special grinding operations.

Check No. 2 on Reply Card for more Details

Tracer Controlled Speed Milling

Machining time required to produce dies, molds, experimental parts and irregular shaped pieces is reduced by an automatic electric tracer control incorporated in Keller milling machines, offered by Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn. Riding smoothly over any contour two to



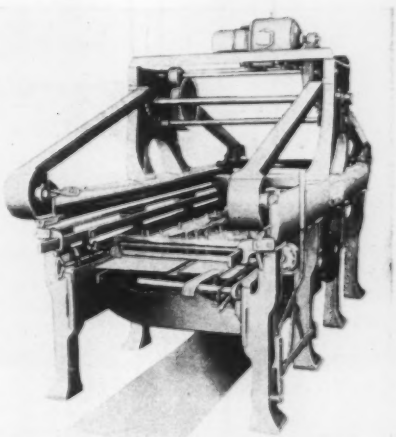
three times faster on finishing operations, the control and its tracer, operating in conjunction with an automatic variable speed control, provides continuous variation of the individual machine motions called for by the tracer in proportion to the slope being followed.

Drive units for the vertical, horizontal and transverse movements have an increased range of travel speeds and step feeds. Units have a single shift and magnetic clutches driven by individual variable speed motors. Travel speeds are infinitely variable from 0.5 to 30 inches per minute and step feeds range from 0.010 to 4 inches in increments of 0.010-inch. Power limiting circuit prevents cutter breakage by overloading. Machine automatically reverses either vertical or horizontal travel motion at the edge of an irregular form or cavity rather than at a fixed length of travel.

Check No. 3 on Reply Card for more Details

Multiple Punching Press

Dies can be arranged to punch round, oval, square or any shape holes, including openings up to 12 x 18 inches, in the No. 3 high speed roller punching press, made by Excelsior Tool & Machine Co., 3100 Ridge



Ave., East St. Louis, Ill. Changing of punches from one size sheet to another requires less than 15 minutes. Dies remain in the machine; punches are pulled out of the dies and inserted in the located holes for the various sheets to be punched. Punching is accurate and ejection is automatic at the rear of the machine.

Capacity of the machine is 40 x 100 inch sheets, 12 gage or lighter. Machine punches in both directions of roller travel, is self-contained and requires no special foundation.

Check No. 4 on Reply Card for more Details

Rolled to the Sand Pile

Capable of mixing all types of foundry sand is the Simpson Porto-Muller, available from National Engineering Co., 549 W. Washington Blvd., Chicago 6, Ill. Mounted on standard 6.00 x 16 implement tires and wheels, the mixer is easily rolled over uneven floors and will handle from 250 to 300 pounds of sand. A spring adjustment preloads the muller with a range of 100 to 275 pounds, to provide correct muller weight for all types of sand.

Power is furnished by 3 hp, 1800

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wheelabrator®

SAVES 9 WAYS

IN CLEANING PRIOR TO GALVANIZING

FOR LINE & CABLE ACCESSORIES LTD., TORONTO, CANADA

1. Saves approx. 20% in labor by reducing wet pickling needs.
2. Saves approx. 80% on changing acids and on general repairs to pickle tanks.
3. Saves $899.04 per year on acid use.
4. Thoroughly and uniformly cleans assembled parts whose components required different pickling times.
5. Permits hot dip galvanizing of fabricated articles without the risk of bleeding after galvanizing (no acids or wet fluxes).
6. Cleans welds as easily as virgin metal to allow 100% coverage with the zinc coating.
7. Eliminates galvanizing rejects due to burned-in sand on castings.
8. Reduces maintenance costs.
9. Increases the productive capacity of the galvanizing department enabling them to do jobbing work.

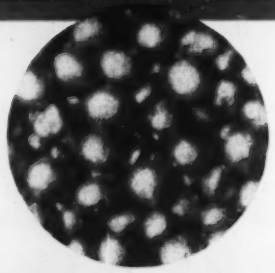
WILL PAY FOR ITSELF IN 2 YEARS

Wheelabrator effects important savings in any shop, large or small. In most cases these savings are sufficient to return the entire investment within 6 to 18 months. An expert analysis of your cleaning problem by one of our engineers will show you definitely how this can be done. Write today for full information.

tru-steel* SAVES 63% ON ABRASIVE COSTS

For Prominent Philadelphia Manufacturer

An accurate test of abrasive consumption in a Wheelabrator Cabinet was conducted recently at an Eastern plant. The abrasive cost per wheel hour with TRU-STEEL Shot was only 52½c compared to $1.38 for chilled iron abrasive. During the test only 360 lbs. of TRU-STEEL were required—in a comparable period 2,670 lbs. of chilled iron were used.



*TRU-STEEL Shot is manufactured by Steel Shot Producers, Inc., Butler, Pa.

American WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka 5, Indiana

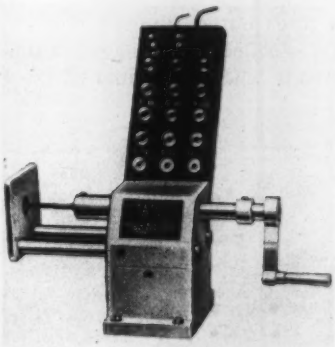
WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

rpm motor. Discharge is through a bottom door which is high enough to permit emptying into a wheelbarrow. A V-belt drive protects the reduction unit against sudden impacts from tramp iron or other objects in the sand.

Check No. 5 on Reply Card for more Details

Cuts Tap Breakage

Taps are held in positive alignment with holes by the Tapit hand tapper for machine screw threads, manufactured by Photo Research Corp., 127 W. Alameda Ave., Burbank, Calif. Said to eliminate tap breakage and work spoilage, the tapper has an



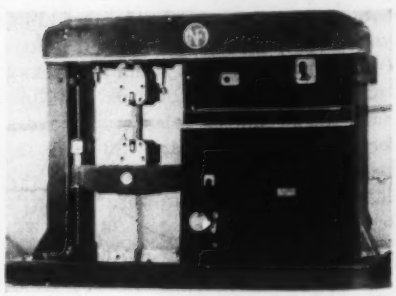
adjustment provided so that all holes can be tapped to a given depth.

Unit is provided with an angle bracket which may or may not be used, depending upon the nature of the work. Bracket is adjustable to accommodate various sizes and shapes of work. High speed machine screw taps, No. 0-80 to 10-32, are available for use with the tapper.

Check No. 6 on Reply Card for more Details

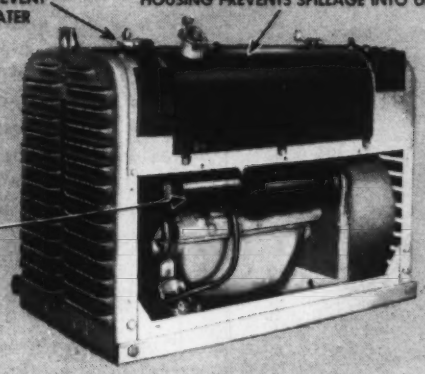
Universal Testing Machine

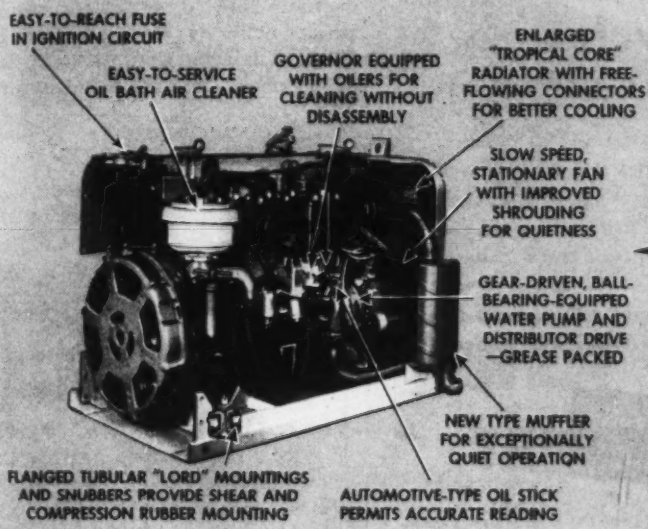
Tension, compression, flexure, shear and transverse tests may be made on the table model universal testing machine developed by National

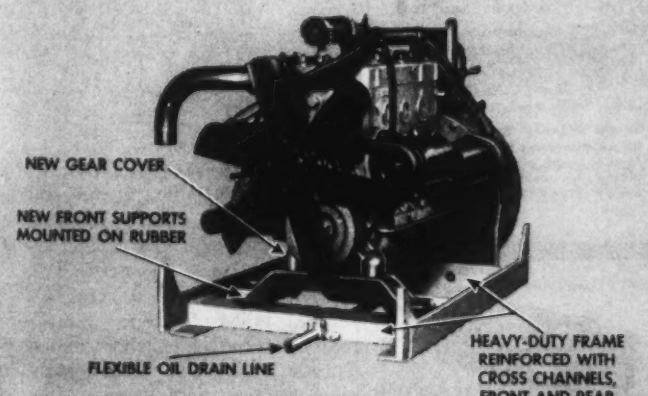


Forge & Ordnance Co., Irvine, Pa. The 30,000 pound capacity model has additional ranges of 6000 and 600 pounds, while the 15,000-pound model may be used for 3000 or 300 pound testing. Loading is mechanical with crosshead speeds infinitely variable

MORE THAN 16 IMPORTANT NEW CHANGES!


PRESSURE CAP COOLING SYSTEM TO PREVENT LOSS OF WATER
OUTSIDE FUEL TANK SET INTO RECESSED HOUSING PREVENTS SPILLAGE INTO UNIT
BELT-DRIVEN CHARGING GENERATOR WITH BELT TAKE-UP


EASY-TO-REACH FUSE IN IGNITION CIRCUIT
EASY-TO-SERVICE OIL BATH AIR CLEANER
GOVERNOR EQUIPPED WITH OILERS FOR CLEANING WITHOUT DISASSEMBLY
ENLARGED "TROPICAL CORE" RADIATOR WITH FREE-FLOWING CONNECTORS FOR BETTER COOLING
SLOW SPEED, STATIONARY FAN WITH IMPROVED SHROUDING FOR QUIETNESS
GEAR-DRIVEN, BALL-BEARING-EQUIPPED WATER PUMP AND DISTRIBUTOR DRIVE —GREASE PACKED
NEW TYPE MUFFLER FOR EXCEPTIONALLY QUIET OPERATION
FLANGED TUBULAR "LORD" MOUNTINGS AND SNUBBERS PROVIDE SHEAR AND COMPRESSION RUBBER MOUNTING
AUTOMOTIVE-TYPE OIL STICK PERMITS ACCURATE READING


NEW GEAR COVER
NEW FRONT SUPPORTS MOUNTED ON RUBBER
FLEXIBLE OIL DRAIN LINE
HEAVY-DUTY FRAME REINFORCED WITH CROSS CHANNELS, FRONT AND REAR

Announcing

The NEW READY-POWER

GENERAL PURPOSE

MODEL H-A

GAS ELECTRIC POWER UNIT FOR ELECTRIC INDUSTRIAL TRUCK OPERATION

"Making a good unit better" was the theme in the development of the finest, most modern Ready-Power Unit ever presented. Refinement features pointed towards important new advantages: remarkably quiet operation; less maintenance; ease of adjustment and complete accessibility. These add up to even longer life and lower operating costs than previous Ready-Power models offered. The new Ready-Power Model H-A has been work-tested and proven under the toughest of conditions. It is designed to replace existing Ready-Power Model "H" units and older models commonly used on Electric Trucks of the following capacities: 4,000 lb. Fork, 6,000 lb. Crane and up to 10,000 lb. Platform.

The READY-POWER Co.
3824 Grand River Ave., Detroit, Mich.

Write for Complete Information

READY-POWER

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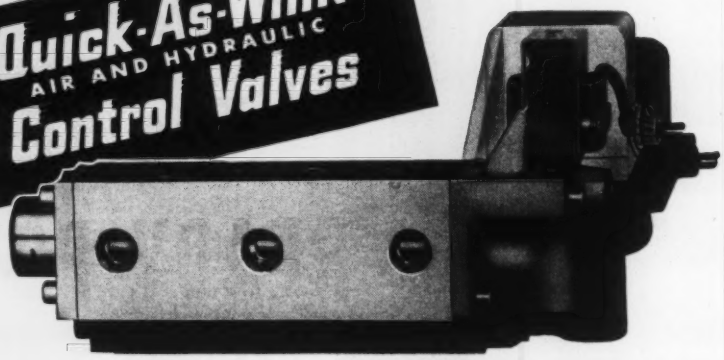
Specify Quick-As-Wink AIR AND HYDRAULIC Control Valves

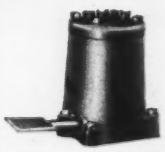


get *Millions of Cycles* of efficient, trouble-free operation

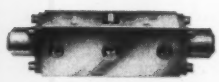
● Quick-As-Wink Solenoid Valves are unsurpassed for positive, trouble-free, dependable service . . . they give users millions of cycles of fast, high speed — and safe — operation. All parts are rugged yet weigh only a few ounces, simplifying electrical circuits, and minimizing wear and maintenance. Careful exhaust porting assures high air economy. 3/8" to 2" sizes. 2, 3 or 4-way actions. Bucking cylinder or double solenoid return. Send for the data sheets. Get full details about Quick-As-Wink, America's outstanding valve line, *today.*

Individual DATA SHEETS for Each Valve — give complete details. Write today!

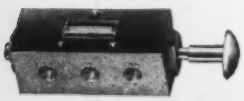
Hand Operated Air Valves—wide variety of uses. 2-way, 3-way, 4-way neutral position and compound exhaust.



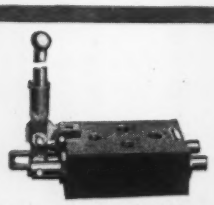
Foot Operated Air Valves—workman has both hands free, speeding production. 2-way, 3-way and 4-way actions.



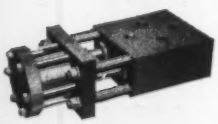
Single Plunger Valves—for air or low pressure hydraulic service. Lever, pilot, cam, diaphragm or solenoid operated. 2-way, 3-way, 4-way actions.



Series "O" and "OE" Valves—for air or hydraulic service up to 125 PSI. Push-pull, cam, pilot, diaphragm and solenoid operated. 1/8" and 1/4" pipe connections. 2-way, 3-way, 4-way and 5-way actions.



Hydraulic Valves—Up to 5000 PSI. Conservatively rated. 1/2", 3/4", 1" and 1 1/2" sizes. 2-way, 3-way, 4-way actions.



Hydraulic Valves—Up to 5000 PSI. Pilot cylinder operated. 1/2", 3/4", 1", 1 1/2" 2", 2 1/2" 3" and 4" sizes 2-way, 3-way, 4-way actions.

Quick-As-Wink Control Valves

THE HIGHER THE PRESSURE THE TIGHTER THE SEAL

Manufactured by **C. B. HUNT & SON, Inc.**

1926 East Pershing Street, Salem, Ohio

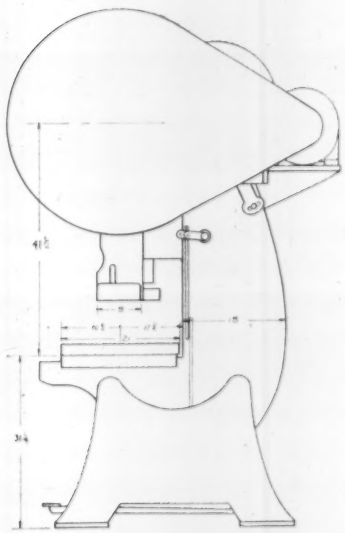
from 0.005 to 6 inches per minute.

Weighing system consist of knife-edge pivot levers connected to calibrated steel elastic beams. Working space between columns is 20 inches with a 14-inch crosshead stroke. Units are 42 inches high and 64 inches wide. They are furnished with gear-operated wedge grips. Fixtures for making compression, flexure and shear tests and holders for threaded specimens are available as extra equipment.

Check No. 7 on Reply Card for more Details

Press Has Long Stroke

Designed with extra stroke length, extra shut height and extra throat depth is the No. 44, 35-ton capacity press, built by Federal Press Co., Elkhart, Ind. It has a standard stroke of 6 inches and shut height of 10



inches. Any stroke from 1 to 12 inches is available; frame extension or added shut height from 1 to 10 inches over standard is available. Throat depth is 11½ inches.

Features include a removable ball seat, round-type ram clamp and a rear-operated reclining mechanism. Timken bearings, nonrepeat clutch mechanism, time-saving knockout bracket are also included. Press has a 21 x 33-inch bed area.

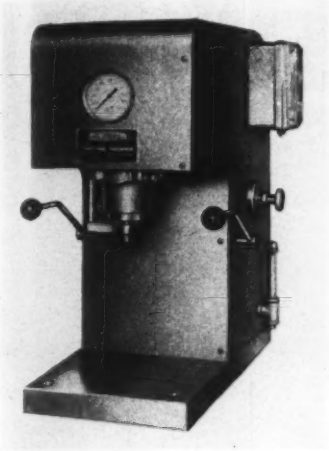
Check No. 8 on Reply Card for more Details

Fast Acting Hydraulic Press

Such production operations as staking, marking, broaching, punching, riveting and press-assembly are within the realm of the self-contained hydraulic Han-D-Press, offered by Hannifin Corp., 1124 S. Kilbourn Ave., Chicago 24, Ill. Both the model F-10 (1 ton) and F-20 (2 ton) units have dual mechanical controls which are

tamper-proof. A 1½ hp 1800 rpm motor operates a 3.3 gallons per minute constant-volume pump.

An adjustable relief valve makes it possible to adjust maximum ram pressure from 10 per cent to full ca-

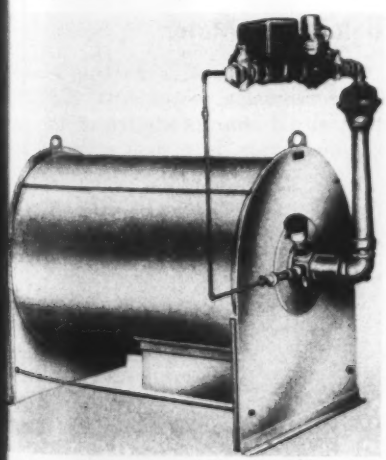


pacity. Press stroke is 6 inches and gap is 10 inches. Press is available without the base, which is removable, making it possible to increase the daylight opening.

Check No. 9 on Reply Card for more Details

Gas Fired Air Heater

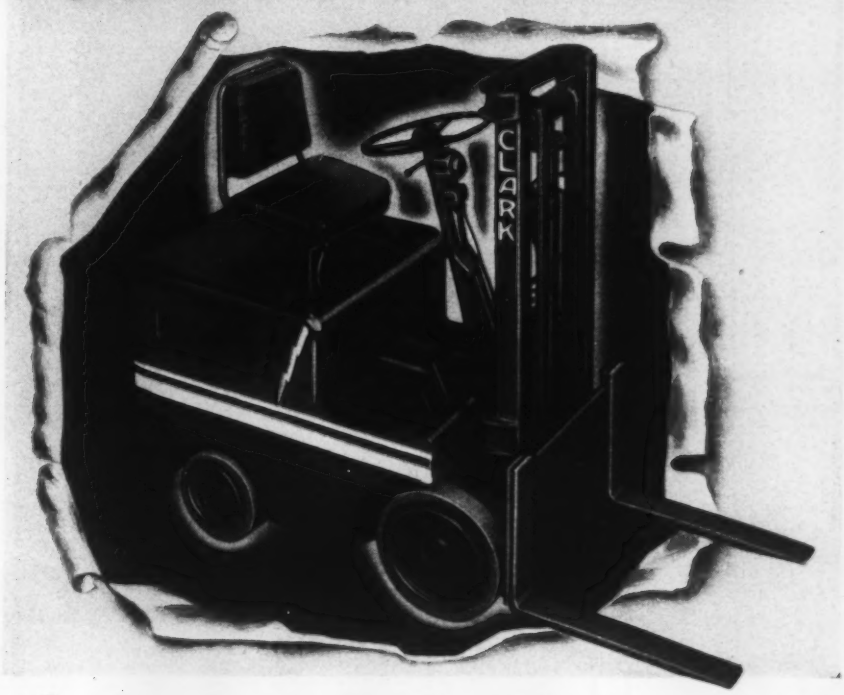
Uniform forced circulation of heated air for operations to 600° F is provided by the Gehnrich atmospheric gas fired air heater for industrial ovens and dryers, made by



W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn. Unit permits changing units using other fuels to be converted to gas.

Air heater is applicable wherever drying or baking is accomplished by hot air circulation and where there is no objection to contact of material with diluted products of gas combination. Construction is of corrosion resistant aluminized sheet steel both

TODAY'S BEST BUY-



The NEW CLARK Electric
TRUCLOADER 1000-lb. Fork Truck

Here are the Reasons Why:

This machine embodies every desirable feature that experienced users have requested. It is the nearest approach yet to the ideal electric 1000-lb. fork-lift truck.

★ **Automatic Acceleration** Automatically accelerated control is standard. First power point selected by directional control lever on steering column—successive points controlled through master switch which in turn is controlled by an automatic timer. Guarantees even acceleration.

★ **Non-Plugging Controls** Impossible to change direction until motor comes to full stop. Important safeguard to windings and other vital components.

★ **"Deadman" Safety Brake** Brake sets automatically when the driver leaves seat; releases when seat is occupied. Combination parking brake and safety feature. Independent of service brake. Directional control lever also automatically *locks in neutral* when driver leaves seat.

★ **Independent Hydraulic System**— Separate motor increases lifting and tilting speeds about 80 per cent—gives drive motor big efficiency boost. Directional lift lever: pulled upward, it raises the forks; pushed downward, it lowers them.

★ **Greater Capacity** Increased lift capacity and speed; increased travel speed. Simplified driving—finger-tip control; non-kick-back steering.

★ **Easy To Service** Battery-compartment cover hinged at front for easy access—plug-receptacle conveniently mounted. All grease fittings within easy reach.

You'll want full information on this new "BEST BUY" in the entire field of Materials Handling. Get in touch with your nearby Clark dealer—you'll find him a capable counselor on your handling problems. The coupon is for your convenience—no obligation.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 26, MICH.
Please send: ☐ Elec.-Truckloader Literature ☐ Movie Digest ☐ Material Handling News

Name_____
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City_____ Zone____ State_____

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

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When ready for shipment, coils are upended onto Unloading Conveyor. Here coils are removed by overhead crane to storage or shipment. Upender shown midway of tilting cycle. Drive is gear segment type.

Solve weight problems the *Logan* way

Handling heavy materials is a 24-hour-a-day task in today's steel mill. And it is a task with which skilled and experienced Logan Conveyor engineers are thoroughly familiar.

Steel coils weighing up to 30,000 pounds, heavy plates, bars and shapes—all move in controlled ease over Logan heavy-duty equipment. No costly breakdowns and no high maintenance expense. Logan steel mill conveying experience dates back over two generations of service to the nation's leading mills. Remember, it's good business to conveyorize every possible operation. Write today for literature or for an engineer to call.

Logan Conveyors

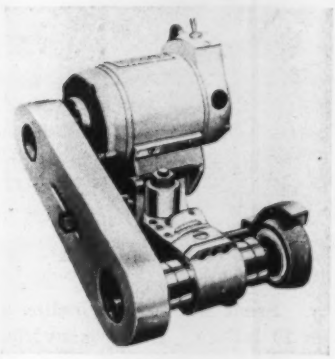
LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

inside and outside and insulation is 2 inches of mineral wool. Six capacities from 250,000 to 2,000,000 Btu per hour are available.

Check No. 10 on Reply Card for more Details

Grinder Is Versatile

Internal, external and surface grinding, as well as thread grinding, may be performed by the T500 tool post and thread grinder introduced by K. O. Lee Co., Aberdeen, S. D. Using a T-slot mount, it will adapt



most standard machine tools for precision grinding operations with an accuracy as close as 0.0001-inch. A ⅝-hp alternating-direct current motor for 115 or 230 v provides spindle speeds from 5000 to 32,000 rpm. Equipment includes 16 grinding wheels, diamond dresser, five pulleys, large and small mounting posts and T-slot plates.

Check No. 11 on Reply Card for more Details

High-Torque Motor

Combining the high starting torque of the repulsion motor with the constant speed characteristics of the induction motor is a new type SCR,

made by General Electric Co., Schenectady 5, N. Y. It is offered in 5, 7½ and 10 hp ratings, all 1800 rpm. Smaller unit operates on 115/230 v, while the other two use the higher voltage.

Featuring high starting torque and

For FRUEHAUF Trailers... It's MUREX, too!

MUREX
ELECTRODES

METAL & THERMIT CORPORATION
100 EAST 42nd STREET • NEW YORK 17, N. Y.

Newark
Philadelphia
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Cleveland
E. Chicago, Ind.
Minneapolis
So. San Francisco

MUREX ELECTRODES and M & T a-c welders work together to provide economical welding in the production of Fruehauf trailers. High speed, specially designed Murex electrodes for joining light sections and sheet metal provide more feet of welding per hour. Efficient M & T a-c transformers reduce idling current to a minimum; assure lower power costs.

Prominent fabricators of every type of welded equipment, both heavy and light, rely on Murex for highest welding quality and welding economy. Let us show you what Murex can do. As a starter, write today for descriptive bulletins on electrodes, machines, accessories.

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low starting current with positive operation at low voltage, it is well adapted for severe starting duty. Of the dripproof type, the Tri-Clad construction affords protection against physical damage, electrical breakdown and operating wear and tear. Ball bearings mounted directly in the end shields assure alignment between rotor and stator.

Check No. 12 on Reply Card for more Details

Easy Operating Chain Block

Chain pull required to keep the load lowering is almost negligible on the Budgit chain block of 1 ton lifting capacity, made by Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore Inc., Muskegon, Mich. Weighing 42 pounds, the unit uses splines instead of keys in its construction.

Light weight is obtained by a simple mechanism and a frame and covers made from aluminum alloy of good shock resisting properties. Load chain is of steel which is heat-treated for strength and toughness. Gearing and shafts are heat-treated steel. Shortest distance between hooks is 15 inches.

Check No. 13 on Reply Card for more Details

• • •

GROUND CLAMP: GC-3, a new lightweight ground clamp of 300 amp capacity is announced by Lincoln Electric Co., Cleveland, O. It is designed to provide a convenient, readily movable, yet solid ground connection for welding jobs where welding currents do not average over 300 amp.

Check No. 14 on Reply Card for more Details

HEAVY DUTY CASTERS: Steel forged, flame hardened Rapistan 500 series casters are available from Rapids-Standard Co. Inc., Grand Rapids, Mich. Designed for heavy duty service on racks, dollies and portable equipment, they are equipped with 2½-inch wide wheels with diameters of 4, 6, 8 or 10 inches in either swivel or rigid types.

Check No. 15 on Reply Card for more Details

HAND TRUCK: Standard Pressed Steel Co., Jenkintown, Pa., announces the new Hallowell Uni-Truk with triple welded angle construction of the nose which eliminates danger of ends of side bars tearing loose.

Check No. 16 on Reply Card for more Details

AIDS VISUAL INSPECTION: Colorama lenses provide large, crystal clear, flexible magnifiers for aiding visual inspection or for part assemblage operations. A fluorescent lamp attached to every lens provides bright illumination of the work. Made by Engineers Specialties Division, Buffalo 8, N. Y., they are 12 inches in diameter and are available in three, six and eight power.

Check No. 17 on Reply Card for more Details

TRANSFERS ACIDS SAFELY: Safe and convenient transfer of acids and other liquids from stainless steel containers is possible with the No. 17 pump introduced by General Scientific Equipment Co., Philadelphia 32, Pa. It is fitted with a safety valve for air line pressure and a hold down clamp to secure pump into the container.

Check No. 18 on Reply Card for more Details

CUTS MICA SLOTS: Electro-Magna-Cut mica undercutter, designed to cut mica slots on all types of armatures for electric motors, was developed by Joy Tool & Die Co. and is available from Pri Kar Engineering Sales Co., Detroit, Mich. Unit features automatic loading, feeding, positioning and unloading mechanisms operated by synchronized electric magnetic and pneumatic systems.

Check No. 19 on Reply Card for more Details

WORK HOLDING DEVICE: Known as the Auto-Grip chuck, the new work holding device made by Oster Mfg. Co., Cleveland, O., eliminates use of chuck bars and T wrenches on all 2-inch pipe threading machines which revolve the work. Gripping action is automatic and equally effective on all kinds of pipe.

Check No. 20 on Reply Card for more Details

PUMPING UNITS: John Dusenbery Co. Inc., Verona, N. J., introduces a new line of midget hydraulic pumping units available with either a 5-pint or 3 gallon capacity reservoir. Reservoir is mounted on an open, a totally enclosed, or an explosion-proof motor, and the pump, check valve and relief valve are enclosed.

Check No. 21 on Reply Card for more Details

PULLERS: Grip - O - Matic pullers, available from Owatonna Tool Co., Owatonna, Minn., have a patented gripping feature and thin jaws. Each size is automatically adjustable to a wide range of applications by the linkage arrangement. There are 14 sizes of pullers in both two jaw and three jaw types ranging from 3¼ to 36-inch reaches.

Check No. 22 on Reply Card for more Details

HAND OPERATED CHUCK: For use on any type drill press, electric drill, lathe, milling machine, etc., or for any machining operation where positive gripping power is required, Ettco Tool Co. Inc., Brooklyn 6, N. Y., announces a hand operated keyless ball bearing drill chuck. Tools such as drills, reamers, counterbores, or any type shank tool, are inserted and hand tightened. Machining action centers tool and tightens grip, preventing slippage. Drill chucks are available in four sizes.

Check No. 23 on Reply Card for more Details

REMOVES IMPURITIES: A continuous boiler blow-off valve that removes highly concentrated impurities from 4 to 6 inches below the water surface at the same rate they are introduced, is offered by Uniblow Valve Co., Cleveland 2, O. It contains no moving parts to require servicing. Valve eliminates foaming and carry-over by maintaining predetermined concentration.

Check No. 24 on Reply Card for more Details

LUBRICATING GUN: An electric Lubrigun, model 249, is introduced by Lincoln Engineering Co., St. Louis 20, Mo., with a pressure primer for dispensing medium and heavy grade lubricants. Units are designed to provide efficient lubrication of industrial machinery requiring high pressure application of medium and heavy lubricants that will not readily seek their own level.

Check No. 25 on Reply Card for more Details

USES GAS OR OIL: Changing from gas to oil or vice versa by throwing switches is one of the main features of the new Flame King series 116 DF packaged boiler burner unit announced by North American Mfg. Co., Cleveland 5, O. This automatic dual-fuel unit is made in two sizes and burns No. 3 oil, or lighter and natural or mixed gases.

Check No. 26 on Reply Card for more Details

HYDRAULIC VALVE: Series 5500 double solenoid operated four-way hydraulic valve, announced by Rivett Lathe & Grinder Inc., Boston, Mass. is designed for use as a semiautomatic electric control of a hydraulic circuit. Located at each end of the valve body, the two solenoids are continuous duty push type. Designed for pressures up to 1500 psi, valves are available in five sizes.

Check No. 27 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

IMPACT of war demands on the steel market is increasingly in evidence. Although military orders so far bulk small in relation to total steel order volume they are rising. And the mills, giving precedence to armament needs under voluntary allocations, already are finding it necessary to revamp some production schedules. While such rescheduling has been minor, it is contributing to shipment delays on civilian account, giving increased impetus to consumers' scramble for protective tonnage before supply conditions worsen as more military orders come out.

ALLOCATIONS— Ultimate policy with respect to steel distribution for the emergency remains to be determined. For the near future it is believed voluntary allocations will prove adequate to care for all likely armament needs. Anticipating a flood of military orders in fourth quarter the steelmakers are booking new civilian business warily, hoping to avoid wholesale rescheduling as far as possible. They are screening all orders as regards end-use, giving tonnage directly or indirectly connected with government contracts preference in rolling schedules.

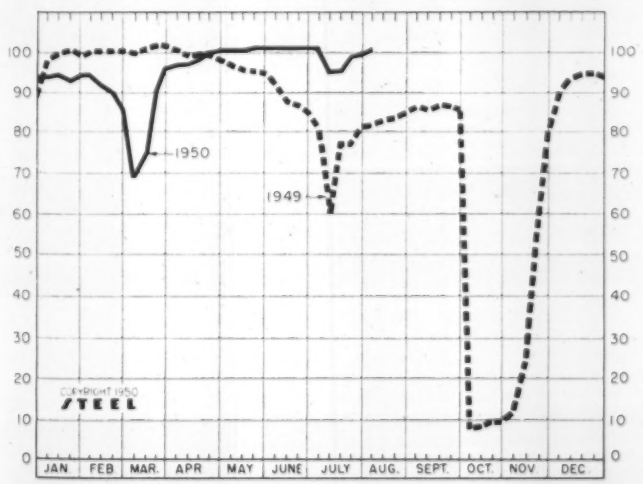
DEMAND— While not yet heavy some substantional military and related orders are appearing. These include requirements for 75 million bushel capacity grain storage bins, low alloy sheets for aircraft, plates for railroad cars, armament of various descriptions, tanks, rockets and munitions in general. Steel bars appear to be the first among the various products noticeably affected by the changing demand. This is especially true of alloy bars. Civilian goods manufacturers are pulling all the stops in their efforts to get in additional tonnage. Much of this inquiry is of a duplicate nature, consumers issuing requests to the trade indiscriminately. These are getting them nowhere, however, since mill screening is resulting in widespread rejections. Since mill tonnage carryover into fourth quarter will be heavy in all products, producers will have little, if any, open tonnage for that period.

MILITARY NEEDS— Volume of steel required for the Korean war and the nation's new rearmament program is unknown. But trade authorities anticipate no severe shortage. Producing capacity tops that of ten years ago by about 20 per cent, now standing at over 100 million tons of ingots with another 5 million tons scheduled for completion within two years. At the outside, it is thought immediately foreseeable military needs may not exceed 10 to 12 million tons of finished steel annually, leaving around 65 million tons for civilian use, about as much as was shipped in 1948. Further, pressure for steel for certain military and defense needs may be less pressing than in World War II. Shipbuilding needs should be smaller with a large fleet of cargo and military vessels in "moth balls." The same is true of war plants, hundreds of which are available for quick conversion from standby status and civilian production. Then, also, steel will be available from Europe in much larger quantity than was possible in the last war.

PRODUCTION— Steelmaking operations increased last week for the fourth successive week reaching 100.5 per cent of capacity. This is equivalent to output of about 1,916,000 tons of ingots.

PRICES— Stability characterized all of the steel product markets last week. STEEL's weighted index on finished steel held at 156.69 and compared with 152.52 for the like week a year ago, while the arithmetical composite held unchanged at $94.36 compared with $91.82 last year. While the undertone of the scrap market strengthened, the price composite on steelmaking grades held at $37.33 compared with $19.34 for the like week of 1949. Pig iron price composites also were unchanged with basic, $45.97, No. 2 foundry, $46.85 and malleable, $47.49.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Aug. 5	Change	Same Week 1949	Same Week 1948
Pittsburgh	101.5	+ 0.5*	76.5	93.5
Chicago	103	+ 1*	89	90.5
Eastern Pa.	98	+ 0.5	78	90
Youngstown	108	+ 1	80	103
Wheeling	100	+ 1.5	92	92.5
Cleveland	99.5	+ 5*	96.5	88.5
Buffalo	104	0	96	99
Birmingham	100	0	100	100
New England	98	+ 6	55	85
Cincinnati	106	0	91	103
St. Louis	86.5	0	75.5	80
Detroit	107	0	106	100
Western	103	+ 5	80	..
Estimated national rate	100.5	+ 1	81.5	94

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
* Change from revised rate.

Composite Market Averages

	Aug. 3 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.69	156.69	156.69	152.52	101.85
Index in cents per lb. ..	4.245	4.245	4.245	4.132	2.759
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.36	$94.36	$94.36	$91.82	$58.27
No. 2 Fdry. Pig Iron, GT	46.85	46.85	46.47	46.10	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT..	47.49	47.49	47.27	47.27	25.29
Steelmaking Scrap, GT..	37.33	37.33	36.83	19.34	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Aug. 3 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ..	3.60	3.60	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.60	3.60	3.60	3.50	2.25
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh...	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh ...	3.25–50	3.25–50	3.25–50	3.25	2.10
Strip H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh ...	4.15–50	4.15–50	4.15–50	4.15–55	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh ..	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	67.00	36.00
Wire rods, $\frac{7}{32}$-$\frac{3}{8}$", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47-$50	$47-$50	$47.00	$47.00	$25.50
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	49.39	26.34
No. 2 Fdry, Pitts.	49.50	49.50	46.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry (Birm.)del.Cin.	49.08	49.08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

*Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt, Pitts. ..	$41.00	$41.00	$40.00	$21.00	$20.00
No. 1 Heavy Melt, E. Pa. .	33.00	33.00	33.00	17.50	18.75
No. 1 Heavy Melt, Chicago..	38.00	38.00	37.50	19.50	18.75
No. 1 Heavy Melt, Valley ..	42.25	40.75	41.50	19.50	20.00
No. 1 Heavy Melt, Cleve...	40.25	38.50	39.50	15.75	19.50
No. 1 Heavy Melt, Buffalo ..	36.75	36.75	39.00	20.75	19.25
Rails, Rerolling, Chicago....	50.50	48.50	47.50	27.75	22.25
No. 1 Cast, Chicago	44.50	44.50	44.50	34.00	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	15.50	15.50	15.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn.....	22.50	22.50	22.50	17.625	12.00
Zinc, E. St. Louis	15.00	15.00	15.00	10.00	8.25
Lead, St. Louis	11.80	11.80	10.80	14.55–60	6.35
Tin, Nek York	98.00	97.75	80.125	103.00	52.00
Aluminum, del.	17.50	17.50	17.50	17.00	15.00
Antimony, Laredo, Tex. ...	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	48.00	$48.50	$49.00	$49.50
Newark,del	50.63	51.13	51.63	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
AlabamaCity,Ala. R2	41.88	42.38	....	....
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward,Ala. W15	41.88	42.38	....	....
Cincinnati,del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y., W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y., T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester,N.Y., del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W-14, Y1	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron,del. from C'eve.	48.39	48.89	48.89	49.39
Lorain,O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Fontana,Calif. K1	52.00	52.50	....	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash., del.	....	54.20	....	....
Portland,Oreg.,del.	....	54.20	....	....
LosAngeles,SanFrancisco,del. ...	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del. (incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	41.50	*42.00	42.00	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	49.50	49.50	50.00
Pitts,N.&S. sides, Ambridge, Aliquippa,del.	....	50.69	50.69	51.19
McKeesRocks,del.	....	50.45	50.45	50.95
Lawrenceville,Homestead, McKeesport, Monaca,del.	....	50.94	50.94	51.44
Verona,del.	....	51.40	51.40	51.90
Brackenridge,del.	....	51.63	51.63	52.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	....	....	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N. Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson,O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2	82.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.00
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Aug. 3, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana, Calif. K1 .... 76.00
Munhall, Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Fontana, Calif. K1 .. $77.00
Detroit R7 ..... 51.00
Houston, Tex. S5 ..... 59.00
Midland, Pa. C18 ..... 51.00
Munhall, Pa. C3 ..... 51.00
So. Duquesne, Pa. C3 .. 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer, Pa. C3 .... $53.00
Clairton, Pa. C3 ..... 53.00
Conshohocken, Pa. A3 .. 58.00
Ensley, Ala. T2 ..... 53.00
Fairfield, Ala. T2 ..... 53.00
Fontana, Cal. K1 ..... 72.00
Gary, Ind. C3 ..... 53.00
Johnstown, Pa. B2 ..... 53.00
Lackawanna, N.Y. B2.. 53.00
Munhall, Pa. C3 ..... 53.00
So. Chicago, Ill. C3 .... 53.00
So. Duquesne, Pa. C3 ... 53.00

Carbon, Forging (NT)
Bessemer, Pa. C3 .... $63.00
Buffalo R2 ..... 63.00
Canton, O. R2 ..... 63.00
Clairton, Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken, Pa. A3.. 65.00
Detroit R7 ..... 66.00
Ensley, Ala. T2 ..... 63.00
Fairfield, Ala. T2 ..... 63.00
Fontana, Calif. K1 .... 82.00
Gary, Ind. C3 ..... 63.00
Geneva, Utah G1 ..... 63.00
Houston, Tex. S5 ..... 71.00
Ind. Harbor, Ind. I-2 .. 63.00
Johnstown, Pa. B2 .... 63.00
Lackawanna, N.Y. B2.. 63.00
LosAngeles B3 ..... 82.00
Munhall, Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So. Chicago C3, R2, W14. 63.00
So. Duquesne, Pa. C3 .. 63.00
So. SanFrancisco B3 ... 82.00

Alloy (NT)
Bethlehem, Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton, O. R2, T7 .... 66.00
Conshohocken, Pa. A3.. 68.00
Detroit R7 ..... 66.00
Fontana, Calif. K1 .... 85.00
Gary, Ind. C3 ..... 66.00
Houston, Tex. S5 ..... 74.00
Ind. Harbor, Ind. Y1 .... 66.00
Johnstown, Pa. B2 .... 66.00
Lackawanna, N.Y. B2 .. 66.00
LosAngeles B3 ..... 86.00
Massillon, O. R2 ..... 66.00
Midland, Pa. C18 ..... 66.00
Munhall, Pa. C3 ..... 66.00
Sharon, Pa. S3 ..... 66.00
So. Chicago C3, R2, W14. 66.00
So. Duquesne, Pa. C3 .. 66.00
Warren, O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton, O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Fontana, Calif. K1 ... 100.00
Gary, Ind. C3 ..... 76.00
Ind. Harbor, Ind. I-2 .... 76.00
Massillon, O. R2 ..... 76.00
So. Chicago, Ill. R2 .... 76.00
So. Duquesne, Pa. C3 .. 76.00

SKELP
Aliquippa, Pa. J5 ..... 3.25
Munhall, Pa. C3 ..... 3.15
Warren, O. R2 ..... 3.15
Youngstown C3, R2 .... 3.15

WIRE RODS
AlabamaCity, Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora, Pa. A7 ..... 3.85
Fairfield, Ala. T2 ..... 3.85
Fontana, Calif. K1 .... 4.60
Houston, Tex. S5 ..... 4.25
Ind. Harbor, Ind. Y1 .... 3.85
Johnstown, Pa. B2 .... 3.85
Joliet, Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa, Colo. C10 .... 4.10
Monessen, Pa. P7 ..... 3.85
No. Tonawanda, N.Y. B11. 3.85
Pittsburg, Calif. C11 ... 4.50
Portsmouth, O. P12 .... 3.85
Roebling, N.J. R5 ..... 3.95
So. Chicago, Ill. R2 .... 3.85
SparrowsPoint, Md. B2 . 3.95
Sterling, Ill. (1) N15 .... 3.85
Struthers, O. Y1 ..... 3.85
Torrance, Calif. C11 ... 4.65
Worcester A7 ..... 4.15

SHEETS BARS (NT)
Fontana, Calif. K1 .... $86.00

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity, Ala. R2 .. 3.40
Aliquippa, Pa. J5 ..... 3.40
Bessemer, Ala. T2 ..... 3.40
Bethlehem, Pa. B2 ..... 3.45
Clairton, Pa. C3 ..... 3.40
Fairfield, Ala T2 ..... 3.40
Fontana, Calif. K1 ..... 4.00
Gary, Ind. C3 ..... 3.40
Geneva, Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind. Harbor, Ind. I-2 .... 3.40
Johnstown, Pa. B2 .... 3.45
KansasCity, Mo. S5 .... 4.00
Lackawanna, N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa, Colo. C10 .... 3.75
Munhall, Pa. C3 ..... 3.40
Niles, Calif. (22) P1 .... 4.02
Phoenixville, Pa. P4 ... 3.45
Portland, Oreg. O4 ..... 4.05
Seattle B3 ..... 4.00
So. Chicago, Ill. C3, W14. 3.40
So. SanFrancisco B3 .... 3.95
Torrance, Calif. C11 .... 4.00
Weirton, W.Va. W6 .... 3.40

Alloy Stand. Shapes
Clairton, Pa. C3 ..... 4.05
Fontana, Calif. K1 .... 5.25
Munhall, Pa. C3 ..... 4.05
So. Chicago, Ill. C3 .... 4.05

H.S., L.A. Stand. Shapes
Aliquippa, Pa. J5 ..... 5.15
Bessemer, Ala. T2 ..... 5.15
Bethlehem, Pa. (14) B2 .. 5.20
Clairton, Pa. C3 ..... 5.15
Fairfield, Ala. T2 ..... 5.15
Fontana, Calif. K1 ..... 5.75
Gary, Ind. C3 ..... 5.15
Geneva, Utah G1 ..... 5.10
Ind. Harbor, Ind. I-2, Y1. 5.15
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. (14) B2 5.20
LosAngeles B3 ..... 5.75
Munhall, Pa. C3 ..... 5.15
So. Chicago, Ill. C3 .... 5.15
So. SanFrancisco B3 .... 5.70
Struthers, O. Y1 ..... 5.15

Wide Flange
Bethlehem, Pa. B2 .... 3.45
Lackawanna, N.Y. B2 .. 3.45
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 .... 3.40

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 .... 5.20
Lackawanna, N.Y. B2 .. 5.20
Munhall, Pa. C3 ..... 5.10
So. Chicago, Ill. C3 .... 5.10

SHEET STEEL PILING
Ind. Harbor, Ind. I-2 .... 4.20
Lackawanna, N.Y. B2 .. 4.20
Munhall, Pa. C3 ..... 4.20
So. Chicago, Ill. C3 .... 4.20
Weirton, W.Va. W6 .... 4.20

BEARING PILES
Munhall, Pa. C3 ..... 3.40
So. Chicago, Ill. C3 .... 3.40

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.35
Bessemer, Ala. T2 ..... 5.35
Clairton, Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken, Pa. A3 .. 5.35
Ecorse, Mich. G5 ..... 5.60
Fairfield, Ala. T2 ..... 5.35
Fontana, Calif. K1 ..... 5.95
Gary, Ind. C3 ..... 5.35
Geneva, Utah G1 ..... 5.35
Ind. Harbor, Ind. I-2, Y1. 5.35
Johnstown, Pa. B2 ..... 5.35
Munhall, Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon, Pa. S3 ..... 5.35
So. Chicago, Ill. C3 .... 5.35
SparrowsPoint, Md. B2.. 5.35
Warren, O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

PLATES, Open-Hearth Alloy
Claymont, Del. W16 .... 4.50
Coatesville, Pa. L7 ..... 4.50
Conshohocken, Pa. A3 .. 4.40
Fontana, Calif. K1 ..... 5.40
Gary, Ind. C3 ..... 4.40
Johnstown, Pa. B2 ..... 4.40
Munhall, Pa. C3 ..... 4.40
Sharon, Pa. S3 ..... 4.40
So. Chicago, Ill. C3 ..... 4.40
SparrowsPoint, Md. B2 .. 4.40

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken, Pa. A3 .. 4.55
Harrisburg, Pa. C5 ..... 4.55
Ind. Harbor, Ind. I-2 .... 4.55
Munhall, Pa. C3 ..... 4.55
So. Chicago, Ill. C3 ..... 4.55

PLATES, Ingot Iron
Ashland, c.l. (15) A10 ... 3.75
Ashland, lcl (15) A10 ... 4.25
Cleveland, c.l R2 ..... 4.10
Warren, O. cl R2 ..... 4.10

PLATES, Carbon Steel
AlabamaCity, Ala. R2 .. 3.50
Aliquippa, Pa. J5 ..... 3.50
Ashland, Ky. (15) A10 .. 3.50
Bessemer, Ala. T2 ..... 3.50
Clairton, Pa. C3 ..... 3.50
Claymont, Del. W16 .... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville, Pa. L7 ..... 3.60
Conshohocken, Pa. A3 .. 3.60
Ecorse, Mich. G5 ..... 3.75
Fairfield, Ala. T2 ..... 3.50
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.50
Geneva, Utah G1 ..... 3.50
Harrisburg, Pa. C5 ..... 3.85
Houston, Tex. S5 ..... 3.90
Ind. Harbor, Ind. I-2, Y1.. 3.50
Johnstown, Pa. B2 ..... 3.50
Lackawanna, N.Y. B2 .. 3.50
Minnequa, Colo. C10 .... 4.30
Munhall, Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon, Pa. S3 ..... 3.50
So. Chicago, Ill. C3, W14. 3.50
SparrowsPoint, Md. B2 .. 3.50
Steubenville, O. W10 .... 3.50
Warren, O. R2 ..... 3.50
Weirton, W.Va. W6 .... 3.50
Youngstown C3, R2, Y1. 3.50

PLATES (Universal Mill)
Fontana, Calif. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana, Calif. K1 .... 5.25

PLATES, Wrought Iron
Economy, Pa. B14 ..... 7.85

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 .. 3.45
Aliquippa, Pa. J5 ..... 3.45
Alton, Ill. (1) L1 ..... 3.45
Atlanta, Ga. A11 ..... 3.60
Bessemer, Ala. T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton, O. R2 ..... 3.45
Clairton, Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse, Mich. G5 ..... 3.65
Emeryville, Calif. J7 .... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1. 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 .... 4.05
Lackawanna, N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.45
Minnequa, Colo. C10 .... 3.85
Niles, Calif. P1 ..... 4.17
N. Tonawanda, N.Y. B11. 3.45
Pittsburg, Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
Portland, Oreg. O4 ..... 4.20
Seattle B3, N14 ..... 4.20
So. Chicago C3, R2, W14. 3.45
So. Duquesne, Pa. C3 .... 3.45
S. SanFran., Cal. B3 .... 4.20
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 .... 4.15
Weirton, W.Va. W6 .... 3.45
Youngstown C3, R2 .... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa, Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown, Pa. B2 ..... 3.45
Lackawanna, N.Y. B2 .. 3.45
Niles, Calif. P1 ..... 4.17
Pittsburgh (23) J5 ..... 3.45
Portland, Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton, W.Va. W6 .... 3.45

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem, Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton, O. R2, T7 ..... 3.95
Clairton, Pa. C3 ..... 3.95
Ecorse, Mich. G5 ..... 4.25
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 3.95
Houston, Tex. S5 ..... 4.35
Ind. Harbor, Ind. I-2, Y1. 3.95
Johnstown, Pa. B2 ..... 3.95
KansasCity, Mo. S5 .... 4.55
Lackawanna, N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon, O. R2 ..... 3.95
Midland, Pa. C18 ..... 3.95
So. Chicago C3, R2, W14. 3.95
So. Duquesne, Pa. C3 .... 3.95
Struthers, O. Y1 ..... 3.95
Warren, O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton, Pa. C3 ..... 4.20
Fontana, Calif. K1 ..... 4.95
Gary, Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa, Pa. J5 ..... 5.20
Altanta A11 ..... 5.35
Bessemer, Ala. T2 ..... 5.20
Bethlehem, Pa. B2 ..... 5.20
Clairton, Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse, Mich. G5 ..... 5.40
Fairfield, Ala. T2 ..... 5.20
Fontana, Calif. K1 ..... 6.25
Gary, Ind. C3 ..... 5.20
Ind. Harbor, Ind. I-2, Y1. 5.20
Johnstown, Pa. B2 ..... 5.20
Lackawanna, N.Y. B2 .. 5.20
LosAngeles B3 ..... 5.90
Pittsburgh J5 ..... 5.20
So. Duquesne, Pa. C3 .... 5.20
So. SanFrancisco B3 .... 5.95
Struthers, O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa, Pa. K5 ..... 4.15
Ambridge, Pa. W18 .... 4.15
BeaverFalls, Pa. M12, R2. 4.15
Buffalo B5 ..... 4.15
Camden, N.J. P13 ..... 4.60
Carnegie, Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 .... 4.15
Detroit P17 ..... 4.30
Donora, Pa. A7 ..... 4.15
Ecorse, Mich. G5 ..... 4.35
Elyria, O. W8 ..... 4.15
FranklinPark, Ill. N5 .... 4.15
Gary, Ind. R2 ..... 4.15
Hammond, Ind. L2, M13. 4.15
Hartford, Conn. R2 ..... 4.55
Harvey, Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield, Mass. B5 .... 4.55
Massillon, O. R2, R8 .... 4.15
Midland, Pa. C18 ..... 4.15
Monaca, Pa. S17 ..... 4.15
Newark, N.J. W18 ..... 4.55
Plymouth, Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.10
Putnam, Conn. W18 .... 4.55
Readville, Mass. C14 .... 4.55
St. Louis, Mo. M5 ..... 4.55
So. Chicago, Ill. W14 .... 4.15
SpringCity, Pa. (5) K3 .. 4.55
Struthers, O. Y1 ..... 4.15
Waukegan, Ill. A7 ..... 4.15
Youngstown F3, Y1 .... 4.15

BARS, Cold-Finished Alloy
Aliquippa, Pa. K5 ..... 4.90
Ambridge, Pa. W18 .... 4.90
BeaverFalls, Pa. M12 ... 4.90
Bethlehem, Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton, O. R2, T7 ..... 4.90
Carnegie, Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora, Pa. A7 ..... 4.90
Elyria, O. W8 ..... 4.90
Gary, Ind. R2 ..... 4.90
Hammond, Ind. L2, M13. 4.90
Hartford, Conn. R2 ..... 5.20
Harvey, Ill. B5 ..... 4.90
Lackawanna, N.Y. B2 .. 4.90
Mansfield, Mass. B5 .... 5.20
Massillon, O. R2, R8 ... 4.90
Midland, Pa. C18 ..... 4.90
Monaca, Pa. S17 ..... 4.90
Newark, N.J. W18 ..... 5.20
Plymouth, Mich. P5 .... 5.10
So. Chicago, Ill. R2, W14. 4.90
Struthers, O. Y1 ..... 4.90
Warren, O. C17 ..... 4.90
Waukegan, Ill. A7 ..... 4.90
Worcester, Mass. A7 .... 5.20
Youngstown F3, Y1 .... 4.90

RAIL STEEL BARS
ChicagoHts. (3) C2, I-2. 3.30
ChicagoHts. (4) C2, I-2. 3.45
Dallas, Tex. (4) S20.... 6.00
Franklin, Pa. (3, 4) F5 .. 3.45
FortWorth, Tex. (26) T4.. 4.18
Huntngtn, W.Va. (3) W7.. 3.45
Marion, O. (3) P11 ..... 3.45
Moline, Ill. (3) R2 ..... 3.40
SouthAvis, Pa. (2) J8.... 3.45
Williamsport (3) S19 .... 3.70

BARS, Wrought Iron
Economy, Pa. (S.R.) B14. 8.60
Economy, Pa. (D.R.) B14 11.00
Economy (Staybolt) B14 11.30
Dover, N.J. (Staybolt) U1 15.00
Dover (Eng. Bolt) U1 .. 13.50
Dover (Wrgt. Iron) U1.. 12.25
McK. Rks. (S.R.) L5 .... 8.60
McK. Rks. (D.R.) L5 ... 11.25
McK. Rks. (Staybolt) L5. 12.75

BARS, Reinforcing (Fabricators)
AlabamaCity, Ala. R2 .. 3.45
Alton, Ill. (6) L1 ..... 3.45
Atlanta A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville, Calif. J7 .... 4.20
Fairfield, Ala. T2 ..... 3.45
Fontana, Calif. K1 ..... 4.10
Gary, Ind. C3 ..... 3.45
Houston, Tex. S5 ..... 3.85
Ind. Harbor, Ind. I-2, Y1. 3.45
Johnstown, Pa. B2 ..... 3.45
KansasCity, Mo. S5 .... 4.05
LosAngeles B3 ..... 4.15
Milton, Pa. B6 ..... 3.45
Minnequa, Colo. C10 .... 4.25
Niles, Calif. P1 ..... 4.17
Pittsburgh, Calif. C11 ... 4.15
Pittsburgh J5 ..... 3.45
SandSprings, Okla. S5 .. 4.35
Seattle, Wash. B3, N14.. 4.20
SouthAvis, Pa. J8 ..... 3.45
So. Chicago, Ill. R2 .... 3.45
So. Duquesne, Pa. C3 .... 3.45
So. SanFrancisco B3 .... 4.20
SparrowsPoint, Md. B2.. 3.45
Struthers, O. Y1 ..... 3.45
Torrance, Calif. C11 .... 4.15
Youngstown C3, R2 .... 3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington, W.Va. W7 .. 4.50
Johnstown, ¼-1" B2 .... 4.35
LosAngeles B3 ..... 5.00
Marion, O. P11 ..... 4.40
Seattle B3, N14 ..... 5.10
SouthAvis, Pa. J8 ..... 4.35
So. SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 .. 4.35
Williamsport, Pa. S19 .. 4.35

SHEET, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity, Ala. R2 .. 3.35
Ashland, Ky. (8) A10 .. 3.35
Butler, Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken, Pa. A3 .. 3.45
Detroit M1 ..... 4.15
Ecorse, Mich. (8) G5 .... 3.55
Fairfield, Ala. T2 ..... 3.35
Fontana, Calif. K1 ..... 4.25
Gary, Ind. C3 ..... 3.35
Ind. Harbor, Ind. I-2, Y1. 3.35
Irvin, Pa. C3 ..... 3.35
Lackawanna, N.Y. B2 .. 3.35
Munhall, Pa. C3 ..... 3.35
Pittsburg, Calif. C11 ... 4.05
Pittsburgh J5 ..... 3.35
Sharon, Pa. S3 ..... 3.50
So. Chicago, Ill. W14 .... 3.35
SparrowsPoint, Md. B2 .. 3.35
Steubenville, O. W10 .... 3.35
Torrance, Calif. C11 .... 4.05
Warren, O. R2 ..... 3.35
Weirton, W.Va. W6 .... 3.35
Youngstown C3, Y1 .... 3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity, Ala. R2 .. 4.50
Dover, O. R1 ..... 4.65
Ind. Harbor, Ind. I-2 .... 4.40
Mansfield, O. E6 ..... 4.15
Niles, O. N12 ..... 4.10
Torrance, Calif. C11 .... 5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken, Pa. A3 .. 5.05
Ecorse, Mich. G5 ..... 5.25
Fairfield, Ala. T2 ..... 5.05
Fontana, Calif. K1 ..... 6.74
Gary, Ind. C3 ..... 5.05
Ind. Harbor, Ind. I-2, Y1. 5.05
Irvin, Pa. C3 ..... 5.05
Lackawanna (35) B2 .... 5.05
Pittsburgh J5 ..... 5.05
Sharon, Pa. S3 ..... 5.05
So. Chicago, Ill. C3 ..... 5.05
SparrowsPoint (36) B2 .. 5.05
Warren, O. R2 ..... 5.05
Weirton, W.Va. W6 ..... 5.05
Youngstown, C3, Y1 .... 5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse, Mich. G5 ..... 6.40
Fontana, Calif. K1 ..... 7.05
Gary, Ind. C3 ..... 6.20
Ind. Harbor, Ind. I-2, Y1. 6.20
Irvin, Pa. C3 ..... 6.20
Lackawanna (37) B2 .... 6.20
Pittsburgh J5 ..... 6.20
SparrowsPoint (38) B2.. 6.20
Warren, O. R2 ..... 6.20
Weirton, W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

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SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED STOCK, 29 Ga.

Yorkville,O. W10	6.00

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron	An'ld	Galv.
Apollo,Pa. B14	12.00	15.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif. C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana, Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. 1-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	...	6.20	6.70	...
Parkersburg F4 (cut lengths)	...	...	...	...	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Parkersburg F4 (cut lengths)	9.30	....	....	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary, C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	4.95
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	3.35
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.50
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Fontana,Calif. K1	11.15
Harrison,N.J. C18	9.50
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	....
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8: Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.50	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.50
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) N8	5.00
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.50
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirten,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Bufffalo Bolt Co.
B14 A. M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
B1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.65
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Williamsport,Pa. B2	6.00
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(12) N8	6.00
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7,T6	8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.55
Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20, R2	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark, 6-8ga. I-1	5.15
No.Tonawanda B11	4.50
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
So.SanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester, Mass. A7	4.80
Worcester,Mass. T6	4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.15
Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo. S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill. K4	126
Crawfordsville M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint, Md. B2	128
Sterling,Ill.(1) N15	126

FENCE POSTS	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity, Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill. N15	116

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

AXLES

Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

NAILS & STAPLES, Stock To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance, Calif. C11	126
Worcester, Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N.Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	9.10
Pittsburgh O3, P14	9.10
Seattle B3	9.35

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron&Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P 17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan.Crucible Steel Co
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3

(1) Chicago base
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base
(22) Del. San Fran. Bay area.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill shipments; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.75a. 0.035" and heavier.

UNIVERSITY OF MICHIGAN LIBRARIES

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.00	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Etna, Pa. N2; Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 1 pt lower on ⅛", 1 pt higher on ⅜" and 1 pt lower on ½" through 3"; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., W10 except 3½ pts lower on ⅛", 2½ pts lower on ¼", 3 pts lower on ⅜" Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10% Both Sides	—Sheets— Carbon Base 10%	20%	Copper Base Both Sides
302	....	....	....	19.75	21.50–24.00	75.00
304	22.50	26.50	....	20.75	22.50–25.5	77.00
305	....	....	....	....	....	79.00
309	28.00	32.00	....	....	....	....
310	34.00	38.00	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–33.5	....
317	32.00	36.00	....	....	....	....
318	31.00	35.00	....	....	....	....
321	24.00	28.00	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–31.5	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	....
430	18.25	24.25	....	....	....	....
Nickel	31.00	41.00	31.50	41.00	....	....	88.00
Inconel	39.00	51.00	....	....	....	....	140.00
Monel	32.00	42.00	26.50	33.50	....	....	83.00
Copper*	....	....	20.70†	25.65‡	....	....	....

* Deoxidized. † 17.20c for hot-rolled. ‡ 22.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville L7; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	27
⅝-in. & ⅞-in.	29
1-in. and larger	26
Longer than 6 in.:	
All diams.	22
Lag bolts, all diams.:	
6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage.	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	Reg.	Heavy
½-in. and smaller	25	
⅝-in. & ⅞-in.	23	
1-in.-1½-in.	23	
1⅝ in. and larger	16	
H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅞-in..	28	25
1-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16
C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	27
1-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	½-in. and smaller	Hvy.	Reg.	Lght.
⅝-in. & ⅞-in.	35	41	41	
1-in.-1½ in..	30	36	36	
1⅝-in.&larger	27	31	33	
	17	21	..	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10

Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.:	
¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c

⅞-in., under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21 00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	39.00	32.00	30.00
302...	39.00	34.50	30.00
303...	41.00	38.00	32.50
304...	41.00	36.50	31.50
309...	53.50	52.50	43.00
316...	54.50	56.50	47.50
321...	47.00	46.00	35.50
347...	51.50	50.00	40.00
410...	34.50	28.50	24.50
416...	35.00	35.00	25.00
420...	42.00	45.00	30.00
430...	37.00	29.00	25.00
501...	25.50	24.00	13.00
502...	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars wire and structurals A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip except Type 309 sheets 54.00c, 316 sheets 55.50c; 309 strip 53.00c, 316 strip 57.50c; 309 bars and wire 43.50c, 316 bars and wire 48.50c U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Types 303, 416, 501, 502 S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport, Pa., bars; sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & Strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars except Type 309 43.50c, type 316 48.50c U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8 .

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 25.00

Tuluol, one deg...18.25-25.75

Industrial xylol ..19.75-27.50

Per ton bulk, ovens

Sulphate of ammonia .$32-45

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.50

Do., less than carlots..14.25

Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Imported, net ton, duty paid, metallurgical grade, $39-40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge Iron:	
98+% Fe, carlots	15.00
Swedish, c.l.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Powder Flakes	44.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	28.50-31.25
Copper:	
Electrolytic	31.75
Reduced	31.50
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	91.12
Zinc, 10-ton lots	20.50-28.00
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8%, minus 65 mesh, freight allowed, 1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-88%, freight allowed, 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur. .$14.00-14.50

Connellsvll,fdry. .15.00-16.00

New River, foundry...19.00

Wise county, foundry..15.95

Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens .$22.00

Everett, Mass., ovens

New England, del.‡ 23.40

Chicago, ovens 21.00

Chicago del. .....‡22.45

Detroit, del. 24.91

Terre Haute, ovens ...21.20

Milwaukee, ovens 21.75

Indianapolis, ovens 20.75

Chicago, del. 24.12

Cincinnati, del. 23.67

Detroit, del. 24.65

Ironton, O., ovens 20.40

Cincinnati, del. 22.71

Painesville, O., ovens .21.90

Buffalo, del. 24.02

Cleveland, del. 23.62

Erie, del. 22.04

Birmingham, ovens 19.15

Birmingham, del. 20.20

Philadelphia, ovens ...21.35

Neville Island,Pa.,ovens 21.00

Swedeland, Pa., ovens..21.20

Portsmouth, O., ovens..20.15

Cincinnati, del. 22.71

Detroit, ovens 21.65

Detroit, del. 22.65

Buffalo del. 24.68

Flint, del. 24.09

Pontiac, del. 23.04

Saginaw, del. 24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.75	6.84	7.73	6.04	...	5.95	6.64	8.60	5.85	6.10	7.54
New York(c'try)	5.55	6.64	7.53	5.84	...	5.75	6.44	8.40	5.65	5.90	7.34
Boston (city) ..	5.93	6.75	7.37	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try) .	5.75	6.55	7.17	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city) ..	6.60-6.70	6.75	7.10	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)..	6.35-6.45	6.50	6.85	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city) ...	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.35	...	6.90	5.63	...	5.53	6.30	...	5.63	5.45	7.13
Wash. (w'hse).	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††[5]	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††[5]	5.35	5.65	6.95
Pitts. (w'hse)..	5.15	5.95*	6.60-6.70	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††[5]	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.30	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse).	5.15	5.95	7.10	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.05	5.30	...	5.30	5.85	9.75††[5]	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.85	5.10	...	5.10	5.65	9.55††[5]	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	6.94	5.44	...	5.44	6.09	9.89††[5]	5.59	5.74	6.94
Milwau. (c'try)	5.29	6.09	7.14	5.24	...	5.24	5.89	9.69††[5]	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††[5]	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††[5]	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[3]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[3]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	8.20	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)..	5.90	7.45	8.00	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco .	6.50[9]	7.60[3]	7.50[3]	7.45[9]	8.25[3]	6.30[9]	7.55	...	6.30[9]	6.40[9]	8.50[9]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—450 to 1499 lb; [6]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅝" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Bonne Terre, Mo., Blue Bell, Williams, Millvale, W. Va., Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Mo., $12.45; Martin, Millersville, Narlo, Clay Center, and Bettsville, O., Billmeyer, Plymouth Meeting, Pa., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Wolframite	$24.50-$24.75
Scheelite	$27.50

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 150)

UNIVERSITY OF MICHIGAN LIBRARIES

Metal Markets Feel War Pangs

Aluminum, copper and zinc supplies now being allocated on voluntary basis with national defense needs receiving top priority. Tin climbs to 98-cent level

New York—Current and prospective national defense requirements for metals are altering nonferrous metal market conditions. The change is being made in an orderly manner and no disruption to operations in the metalworking industry has developed. Government controls will outlaw hoarding of materials in short supply, or trading in these materials at excessive price levels. Major nonferrous metals undoubtedly will be included in those materials brought under government surveillance.

Producers are "policing" their markets thoroughly on a voluntary basis. Reynolds Metals Co. for instance, is allocating aluminum metal to its customers, giving priority to all orders for national defense purposes. Aluminum Co. of America had adopted a similar policy previously.

Supplies Being Allocated—Copper and zinc producers are restricting the amount of metal being sold to their regular customers. Requirements for the defense program and stockpiling plus industrial needs at recent rates, indicates a monthly deficit of some 42,000 tons of copper and over 6000 tons of zinc. This indicates that industrial consumers will encounter a further tightening in supplies, since supplies cannot be augmented immediately.

So far metal fabricators have not received any large military orders which would cut into their civilian production schedules. A heavy influx of these orders, especially for brass mill products, within a short time would not be surprising. In the meantime, producers are selling at unchanged price levels: Copper, at 22.50c, Valley; lead, at 11.80c, St. Louis; and zinc, at 15.00c, E. St. Louis.

Tin Prices Fluctuate—The tin market continues to fluctuate widely with spot climbing to 98.00c after having dropped to 94.75c on July 28. Fear of spread of Korean troubles to Malaya is influencing the feverish price trend. Office of Industry and Commerce will continue to collect and compile statistics on tin under a voluntary industry reporting system, using a revised reporting form, OIC-412. The revised customs transaction form, OIC-1040, will be available shortly at Department of Commerce field offices.

The report for May showed that the total new supply in that month was well above that of any month since 1941. The 11,029 tons imported in May, plus the 8366 tons received in June, brings the monthly average for the first half of 1950 to about 6900 tons. Imports of tin concentrates dipped sharply again in May with only 374 tons reported. This decline is due to the lack of contracts with producers in Bolivia, as well as to the failure of Indonesian concentrates to reach United States ports in May.

Total tin consumption in this country in May reached the highest figure since 1942 with 8211 tons of primary and secondary metal consumed. Consumption of primary tin in May was 5835 tons compared with 5579 tons in April. The total tin, primary and secondary, consumed in the first five months of 1950 totaled 37,032 tons, or an annual rate of 89,000 tons.

Total United States tin metal stocks, excluding stockpile, increased from 42,270 tons on May 1 to 43,417 tons on June 1. Tin metal afloat to the United States as of May 31 was 7588 tons.

Platinum Diverted to War Uses

New York—No platinum is available at present for sale to jewelry manufacturers. Manufacturers are being advised that "some platinum" may become available this month, but whatever supplies are on hand will be strictly allocated.

Herman Ostrin, president, Associate Jewelers Inc., this city, said the Korean war caught jewelry manufacturers here during their annual shutdown period the first two weeks in July. "No important transactions took place until after business resumed July 17," he said. "When they returned to business they first found a price rise in platinum in effect, and and subsequently were told it was not available for jewelry. The short supply of platinum, therefore, is traced to its diversion to war uses, rather than to anticipatory buying."

STEEL'S Metal Price Averages for July, 1950

(Cents per pound)

Electrolytic Copper, del. Conn.	22.500
Lead, St. Louis	11.460
Prime, Western Zinc, E. St. Louis	15.000
Straits Tin, New York	89.680
Primary Aluminum Ingots, del.	17.500
Antimony, f.o.b. Laredo, Tex.	24.500
Nickel, f.o.b. refinery	48.000
Silver, New York	72.750

Kaiser Expands Aluminum Mills

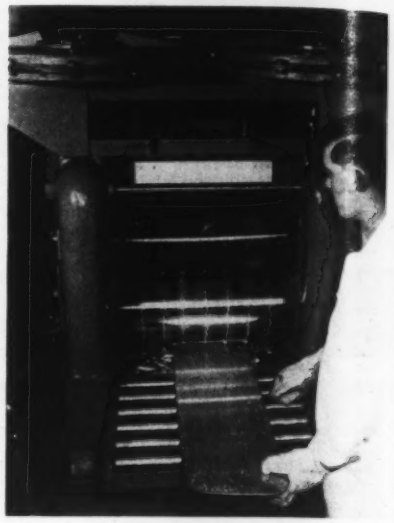
Oakland, Calif.—Kaiser Aluminum & Chemical Corp. bought a 140-pot aluminum potline from the government's aluminum mill at Riverbank, Calif., and will install the new line at its Mead reduction mill at Spokane, Wash. The line, the seventh at Mead, will increase annual capacity by 40 million pounds. Cost of the installation will be about $2 million, and the line should be in operation by next March.

Prior to the expansion, Kaiser had made smaller expansions and improvements in its reduction mills at Spokane and Tacoma to raise annual capacity by 40 million pounds over the original capacity. When all of the current expansion is completed by next March, the two plants will have a capacity of 340 million pounds of pig aluminum a year.

An increase of 25 per cent or 72 million pounds a year, is scheduled for Kaiser's Trentwood rolling mill at Spokane. It will be accomplished by adding some new equipment and improving existing machinery.

To meet increased demands from the reduction plants, Kaiser plans a step-up in alumina production at its bauxite plant in Baton Rouge, La.

At the company's Newark, O., fabricating plant, expansions now underway will allow production of several score new products, Kaiser says.



Authenticated

VEST POCKET MILL: Kaiser's 525-acre Trentwood aluminum rolling mill in Spokane turns out 5000-pound ingots into over a quarter of a billion pounds of aluminum sheet, strip and plate annually. But most of its complex processes are for all practical purposes duplicated in a tidy, two-room laboratory. In a miniature pilot mill the pig aluminum is remelted and alloyed in lab size furnaces, rolled to slab and plate or sheet in this 6-foot rolling mill. Here you see the ingot emerging as a thin sheet of special purpose, experimental aluminum alloy

Brass Ingot Output Rises

Washington—Output of brass and bronze ingot increased 3 per cent in May to 26,492 short tons compared to April, reports the Bureau of Mines. This total was greater than for any month since January, 1947, when 30,836 tons were produced. Highest monthly output in 1946 was the October total of 33,459 tons. The greatest individual increase in May was 469 tons in yellow brass ingot.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 22.50c, Conn. Valley; Lake 22.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.50c; 80-10-10 (No. 305) 25.50c; No. 1 yellow (No. 405) 19.00c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.10c, delivered.

Lead: Common 11.80c; chemical 11.90c; corroding 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.00-20.25c; No. 12 foundry alloy (No. 2 grade) 19.00-19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 20.50c; grade 2, 1950c; grade 3, 19.00c; grade 4, 18.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 22.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 98.00c, Aug. 96.50c Sept. 95.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 20.75c; English, 21.00c; Belgian, 21.50c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $77-$80 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.15 del.; special or patented shapes, $2.30.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $74-$77 per ounce.

Palladium: $24 per troy ounce.

Iridium: $160 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 22.50-cent copper.)

Sheet: Copper 37.43; yellow brass 34.19; commercial bronze, 95%, 37.38; 90%, 36.93; red brass, 85% 35.96; 80%, 35.52; best quality, 35.04; nickel silver, 18%, 48.39; phosphor-bronze, grade A, 5% 55.11.

Rods: Copper, hot-rolled 33.28; cold-drawn 34.53; yellow brass free cutting, 28.54; commercial bronze, 95% 37.07; 90% 36.62; red brass 85% 35.65; 80% 35.21.

Seamless Tubing: Copper 37.47; yellow brass 37.20; commercial bronze 90% 39.59; red brass 85% 38.87; 80% 38.43.

Wire: Yellow brass 34.48; commercial bronze, 95% 37.67; 90% 37.22; red brass, 85% 36.25; 80% 35.81; best quality brass 35.33.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 26.67, l.c.l. 27.17, 100,000 lb lots 26.545; weatherproof, f.o.b. eastern mills, c.l. 28.10, l.c.l. 28.60, 100,000 lb lots 27.85; magnet, del., 15,000 lb or more 32.50, l.c.l. 33.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, in., incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	——Hexagonal—— 17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List prices plus 45%.

ZINC

Sheets, 20.75c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.00c; over 12-in., 20.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 75.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip, cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-59.00c; 25 to 99 lb. 45.00-49.00c; 100 lb to 5000 lb, 38.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 34.09c; oval 33.59c; cast 32.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 51.40c, under 1000 lb 49.40c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 28.00c; over 200 lb, 27.00c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c; 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 29.50c; 400-lb bbl. 27.50c up to 10,000 lb, 27.05c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 44.6c, 10 or more drums 42.6c, f.o.b. Niagara Falls, N. Y.; 45.85c and 43.85c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	19.50	19.50	18.75
Yellow Brass	16.75	16.50	15.50
Commercial Bronze			
95%	18.50	18.25	17.75
90%	18.375	18.125	17.625
Red brass			
85%	18.125	17.875	17.375
80%	17.875	17.625	17.125
Best Quality (71-80%)	17.50	17.25	....
Muntz metal	15.75	15.50	15.00
Nickel, silver, 10%	19.12½	18.87½	9.56¼
Phos. bronze, A	19.75	19.50	18.50
Naval brass	16.12½	15.87½	15.37½
Manganese bronze	16.12½	15.87½	15.25

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 19.50; No. 2 copper 18.50; light copper 17.50; composition red brass 16.50; radiators 13.50; heavy yellow brass 12.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.50; No. 2 copper 18.50; light copper 17.50; refinery brass (60% copper) per dry copper content 17.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 17.75-18.00; No. 2 16.50-16.75; light copper 15.50-15.75; No. 1 composition red brass 14.25-14.50; No. 1 composition turnings 13.75-14.00; mixed brass turnings 8.75-9.00; new brass clippings 15.00-15.25; No. 1 brass rod turnings 13.25-13.50; light brass 8.75-9.00; heavy yellow brass 10.00-10.25; new brass rod ends 13.50-13.75; auto radiators, unsweated 11.00-11.25; cocks and faucets, 12.75-13.00; brass pipe 13.00-13.25.

Lead: Heavy 9.75-10.00; battery plates 5.25-5.50; linotype and stereotype 11.50-11.75; electrotype 9.75-10.00; mixed babbitt 9.75-10.00.

Zinc: Old zinc 8.00-8.25; new die cast scrap 8.25-8.50; old die cast scrap 5.50-5.75.

Tin: No. 1 pewter 50.00-52.00; block tin pipe 70.00-72.00; No. 1 babbitt 45.00-47.00.

Aluminum: Clippings 2S 12.00-12.50; old sheets 9.00-9.50; crankcase 9.00-9.50; borings and turnings 6.00

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. 2-3	22.50	11.80	15.00	98.00	17.50	24.50	48.00	72.75
Aug. 1	22.50	11.80	15.00	97.50	17.50	24.50	48.00	72.75
July Avg.	22.50	11.46	15.00	89.68	17.50	24.50	48.00	72.75
July 31	22.50	11.80	15.00	95.50	17.50	24.50	48.00	72.75
July 28-29	22.50	11.80	15.00	94.75	17.50	24.50	48.00	72.75
July 26-27	22.50	11.80	15.00	97.50	17.50	24.50	48.00	72.75
July 24-25	22.50	11.80	15.00	96.00	17.50	24.50	48.00	72.75
July 21-22	22.50	11.80	15.00	93.00	17.50	24.50	48.00	72.75
July 20	22.50	11.80	15.00	91.00	17.50	24.50	48.00	72.75
July 19	22.50	11.80	15.00	89.50	17.50	24.50	48.00	72.75
July 18	22.50	11.80	15.00	91.00	17.50	24.50	48.00	72.75
July 17	22.50	11.80	15.00	91.75	17.50	24.50	48.00	72.75
July 14-15	22.50	11.80	15.00	96.50	17.50	24.50	48.00	72.75
July 13	22.50	11.80	15.00	92.00	17.50	24.50	48.00	72.75
July 12	22.50	11.30	15.00	87.25	17.50	24.50	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

UNIVERSITY OF MICHIGAN LIBRARIES

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Aug. 3, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Aug. 3	$37.33
July 27	37.33
July 1950	37.04
Aug. 1949	20.86
Aug. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$41.00
No. 2 Heavy Melt.	35.00
No. 1 Busheling	41.00
No. 1 Bundles	41.00
No. 2 Bundles	*34.00*
Heavy Turnings	37.00-38.00
Machine Shop Turnings	30.00-31.00†
Mixed Borings, Turnings	30.00-31.00†
Short Shovel Turnings	33.50-34.50
Cast Iron Borings	32.00-33.00
Low Phos. Steel	*47.00-48.00*

Cast Iron Grades

No. 1 Cupola Cast	*39.00-40.00*
No. 1 Machinery Cast	*45.00-46.00*
Charging Box Cast	40.00
Heavy Breakable Cast	*37.00-38.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
Rails, Random Lengths	43.00
Rails, 2 ft. and under	48.00
Rails, 18 in. and under	49.00
Railroad Specialties	46.00-47.00
Axles	44.00
Angles, Splice Bars	45.00

† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	*$40.00-40.50*
No. 2 Heavy Melt. Steel	*35.50-36.00*
No. 1 Busheling	*40.00-40.50*
No. 1 Bundles	*40.00-40.50*
No. 2 Bundles	29.00-30.00
Machine Shop Turnings	*27.00-27.50*
Mixed Borings, Turnings	*30.00-30.50*
Short Shovel Turnings	*30.00-30.50*
Cast Iron Borings	*30.00-30.50*
Low Phos.	*42.00-42.50*

Cast Iron Grades

No. 1 Cupola	*46.00-47.00*
Charging Box Cast	*42.00-43.00*
Stove Plate	*41.00-42.00*
Heavy Breakable Cast	*39.00-40.00*
Unstripped Motor Blocks	*32.00-33.00*
Brake Shoes	*34.00-35.00*
Clean Auto Cast	*46.00-47.00*
No. 1 Wheels	*42.00-43.00*
Burnt Cast	*36.00-37.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00
R.R. Malleable	49.00-50.00
Rails, 3 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, Random Lengths	48.00-49.00
Cast Steel	41.50-42.00
Railroad Specialties	45.00-46.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-50.50

VALLEY

No. 1 Heavy Melt. Steel	*$42.00-42.50*
No. 2 Heavy Melt. Steel	*37.00-3750*
No. 1 Bundles	*42.00-42.50*
No. 2 Bundles	31.50-32.00
Machine Shop Turnings	*31.00-31.50*
Short Shovel Turnings	*33.50-34.00*
Cast Iron Borings	*33.50-34.00*
Low Phos.	*45.00-45.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$33.00
No. 2 Heavy Melt. Steel	31.00
No. 1 Busheling	32.00
No. 1 Bundles	33.00
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	24.00
Short Shovel Turnings	29.00
Mixed Borings, Turnings	22.00-23.00
Low Phos. Punching and Plate, elec. fur. grade	39.00-40.00
Low Phos. Plate, 5 ft & Under	39.00-40.00
Elec. Furnace Bundles	*36.50*
Heavy Turnings	33.00*
No. 1 Chemical Borings	34.00
Knuckles and couplers	41.00-43.00
Steel car wheels	41.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	36.00
No. 1 Machinery Cast	39.00-40.00
No. 1 Yard Cast	34.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast	36.00-37.00
Clean Auto Cast	39.00-40.00
No. 1 Wheels	41.00-42.00
Malleable	45.00

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	*$38.00*
No. 2 Heavy Melt. Steel	*32.00*
No. 1 Busheling	*38.00*
No. 1 Bundles	*38.00*
No. 2 Black Bundles	*31.00*
No. 3 Bundles	26.00
Machine Shop Turnings	*23.00*
Short Shovel Turnings	*26.00*
Mixed Borings, Turnings	*25.00*
Cast Iron Borings	*26.00*

Cast Iron Grades

No. 1 Cupola Cast	47.00
Charging Box Cast	36.00
Stove Plate	33.00
Heavy Breakable Cast	38.00
Unstripped Motor Blocks	29.00
Brake Shoes	26.00
Clean Auto Cast	47.00
Drop Broken Cast	49.00
Low Phos., 18 in. and under	47.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*41.00*
R.R. Malleable	44.00
Rails, Rerolling	*45.00*
Rails, Random Lengths	*43.00*
Rails, 18 in. and under	50.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$28.50-29.50
No. 1 Bundles	38.50-39.50
No. 2 Bundles	26.00-27.00
No. 1 Busheling	36.00-37.00
Machine Shop Turnings	23.00-24.00
Forge Flashings	36.00-37.00
Short Shovel Turnings	25.00-26.00
Cast Iron Borings	25.00-26.00
Punchings & Plate Scrap	38.50-39.50

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Heavy Breakable Cast	33.00-34.00
Clean Auto Cast	44.00-45.00

BUFFALO

No. 1 Heavy Melt. Steel	$36.50-37.00
No. 2 Heavy Melt. Steel	33.00-33.50
No. 1 Busheling	33.00-33.50
No. 1 Bundles	34.00-34.50
No. 2 Bundles	31.00-31.50
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Short Shovelings	29.00-30.00
Low Phos.	38.50-39.00

Cast Iron Grades

No. 1 Cupola	35.50-36.00
No. 1 Machinery	38.50-39.00
Malleable	32.50-33.00

Railroad Scrap

Rails, 2 ft. and under	46.50-47.00
Rails, random size	40.50-41.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$30.00-31.00*
No. 2 Heavy Melt. Steel	26.00-27.00
No. 1 Busheling	*28.00-29.00*
No. 1 Bundles	*30.00-31.00*
No. 2 Bundles	25.00-25.50
Machine Shop Turnings	*19.00-20.00*
Mixed Borings, Turnings	*19.00-20.00*
Short Shovel Turnings	21.00-22.00
Punchings & Plate Scrap	31.00-32.00
Low Phos. Plate, 5 ft & under	31.00-32.00
Elec. Furnace Bundles	30.00-31.00

Cast Iron Grades

No. 1 Cupola Cast	29.00-29.50
No. 1 Machinery	30.00-31.00
Charging Box Cast	29.00-29.50
Heavy Breakable	29.00-29.50
Unstripped Motor Blocks	21.00-22.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$29.00-30.00*
No. 2 Heavy Melt. Steel	*23.50-24.00*
No. 1 Bundles	*29.00-30.00*
Machine Shop Turnings	*20.50-21.00*
Short Shovel Turnings	22.00-23.00
Mixed Borings, Turnings	*18.50-19.50*
No. 1 Busheling	28.50-29.00
Bar Crops and Plate	*34.50-35.50*
Punchings & Plate Scrap	*34.50-35.50*
Chemical Borings	21.00-21.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	28.00-29.00
Heavy Breakable Cast	*27.50-28.50*
Stove Plate	26.50-27.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.00
No. 2 Heavy Melt. Steel	36.00
No. 1 Bundles	38.00
No. 2 Bundles	31.00
Machine Shop Turnings	*26.00-27.00*
Mixed Borings, Turnings	*26.00-27.00*
Short Shovel Turnings	*29.00-30.00*
Cast Iron Borings	*29.00-30.00*
Low Phos.	*44.00-45.00*
Elec. Furnace Bundles	38.00-39.00
Heavy Turnings	*31.00-32.00*
Cut Structurals	*44.00-45.00*

Cast Iron Grades

No. 1 Cupola Cast	44.00-45.00
Clean Auto Cast	44.00-45.00
No. 1 Wheels	38.00-39.00
Stove Plate	36.00-37.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	39.00-40.00
Malleable	44.00-45.00
Rails, Rerolling	*50.00-51.00*
Rails, Random Lengths	*45.00-46.00*
Rails, 2 ft and under	*49.00-50.00*
Rails, 18 in. and under	*51.00-52.00*
Railroad Specialties	*44.00-45.00*
Angles, Splice Bars	*45.00-46.00*

BIRMINGHAM

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	28.00
No. 1 Busheling	29.00-30.00
No. 2 Bundles	22.00
Machine Shop Turnings	25.00-26.00
Mixed Borings, Turnings	28.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	37.00-38.00
Cut Structurals	*37.00-38.00*

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Stove Plate	34.00-35.00
No. 1 Wheels	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	35.00
R.R. Malleable	nominal
Rails, Rerolling	43.00-44.00
Rails, 3 ft and under	*46.00-47.00*
Angles and Splice Bars	40.00-41.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$36.00-38.00
No. 2 Heavy Melt. Steel	32.00-33.00
No. 1 Bundles	36.00-38.00
No. 2 Bundles	32.00-33.00
No. 3 Bundles	27.00-29.00
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	39.00-41.00
Charging Box Cast	35.00-37.00
Heavy Breakable Cast	35.00-36.00
Brake Shoes	37.00-38.00
Clean Auto Cast	40.00-42.00
Burnt Cast	35.00-36.00

Railroad Scrap

R.R. Malleable	41.00-42.00
Rails, Rerolling	48.00-50.00
Rails, Random Lengths	39.00-41.00
Rails, 3 ft and under	45.00-46.00
Uncut Tires	38.00-39.00
Angles, Splice Bars	43.00-44.00
Railroad Specialties	41.00-42.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Bundles	18.00
No. 2 Bundles	17.00
No. 3 Bundles	15.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Random Lengths	22.00

SEATTLE

No. 1 Heavy Melt. Steel	*$24.00*
No. 2 Heavy Melt. Steel	*24.00*
No. 1 Busheling	*21.50*
Nos. 1 & 2 Bundles	*22.00*
No. 3 Bundles	*20.00*
Machine Shop Turnings	13.00
Mixed Borings, Turnings	13.00
Punchings & Plate Scrap	27.50-30.00
Cut Structurals	27.50-30.00

Cast Iron Grades

No. 1 Cupalo Cast	30.00
Heavy Breakable Cast	27.50
Stove Plate	25.00
Unstripped Motor Blocks	25.00
Malleable	27.50
Brake Shoes	25.00
Clean Auto Cast	30.00
No. 1 Wheels	30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00
Railroad Malleable	27.50
Rails, Random Lengths	21.00
Angles and Splice Bars	21.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	*$23.50*
No. 2 Heavy Melt. Steel	*21.50*
Nos. 1 & 2 Bundles	*17.50*
No. 3 Bundles	*14.50*
Machine Shop Turnings	7.50
Mixed Borings, Turnings	5.00
Punchings & Plate Scrap	*32.00*

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*22.50*
Rails, Rerolling	*39.50*

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades

Cast	40.00-43.00*

* F.o.b. shipping point.

Sheets Strip . . .

Sheet and Strip Prices, Page 131 & 132

New York—Early revision of sheet and strip schedules looms. Some distribution of September volume will be affected by armament requirements. With mills practically booked for balance of this year, but not scheduled beyond October as a rule, pattern of distribution in fourth quarter will undergo changes to take care of new government requirements.

Boston—Civilian allocations of flat-rolled will be revised in fourth quarter to the extent armament needs develop. Carryovers of carbon sheets will be heavy and where October schedules are temporarily determined, volume of delinquent tonnage is big.

Philadelphia—Delays in opening books for fourth quarter is to avoid rescheduling later. Where October schedules are tentatively fixed further revisions are likely. Producers are screening inquiries as to end-use and if tonnage is directly or ndirectly connected wth government contracts, this steel will be given preference in rolling. Although not yet heavy, some tonnage of this character is appearing, including requirements for 75 million bushel capacity grain storage bins, low alloy sheets for aircraft, railroad car building and armament equipment assemblies, including rockets.

Pittsburgh — Military or related end-use sheet and strip tonnage is increasing steadily. Producers are voluntarily scheduling these orders for October and November delivery on basis of individual companies percentage share of industry's overall capacity. In many instances such orders do not originate from regular customers.

Jones & Laughlin Steel Corp. is scheduling plate production on its 77-inch mill in Cleveland.

Cleveland—Clamor for sheets and strip is unabated as consumers seek to augment inventories before supply conditions worsen under impact of war requirements. Producers could book to capacity into 1951 were they so disposed. But they are sticking rigidly to customer quotas and are turning away considerable inquiry, some of which is of a duplicate nature. Customers are being warned fourth quarter allotments will be cut if military needs necessitate such action.

Chicago — Little, if any, of the heavy demand for sheet and strip can be traced to commitments for Korean war goods.

Acme Steel Co., Chicago, was awarded contract for 827 tons, steel strapping, type one, $212,634.40, and Brainard Steel Co., Warren, O., 675 tons at $182,757.40 by the Chicago Quartermaster Depot. Same office placed an order for 1231 tons steel wire nails with Jones & Laughlin Steel Corp., Pittsburgh, $179,761.47. Acme Steel Co. was also awarded, under another contract, 905 tons, type one, nailless, class B, galvanized flat steel strapping at $245,612.16.

Birmingham—Sheet production lags considerably behind demand. Further disruption in delivery schedules is expected within a few weeks as tonnage is diverted to defense purposes.

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Steel Bars . . .

Bar Prices, Page 131

Cleveland—Merchant bar sellers are booked into fourth quarter and are chary about accepting additional tonnage pending clarification of the demand outlook with respect to military requirements. So far such needs do not bulk large in mill commitments, but gradual upturn in demand is expected from here on. Producers are anticipating an early sharp rise in requirements for aircraft forgings.

Boston—Improvement in alloy demand marks feverish bar buying. Most producers are booked into fourth quarter on carbon to extent they are willing to accept volume. Where end use is definitely established, armament orders are given preference. Springfield armory is heavier buyer of carbon and alloy material, including 192,009 alloy barrel blanks, or roughly 500 tons. Contracts went to Mid West Forge Co., Cleveland; Moore Drop Forging Co., Springfield, and Kropp Forging Co., Chicago.

New York—Aircraft forgings require more steel, accounting in part for increased demand for alloys. Hot-rolled carbon bar capacity is sold well into fourth quarter, but schedules and distribution are likely to be increasingly influenced by armament needs.

Philadelphia—Effect of armament contracts is likely to influence bars first among steel products. This is already apparent in heavier alloy inquiry and steel and rocket contracts. Range in sizes is gradually broadening and forge shop requirements are heavier.

Los Angeles—Bar mill output is now on allocation. Pacific Tube Co. started production of cold-drawn bars, currently producing rounds in sizes 3/16 to 2½-in. in two grades—B 1113 and C 1018, and ground and polished shafting from ½ to 2-in.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 131

New York—Buying of and inquiry for reinforcing steel is heavy. Highway and bridge requirements are large; New Jersey turnpike, taking close to 20,000 tons, will be under contract for completion next month.

Boston — Fabricating facilities of concrete bar distributors are taxed to meet heavy demand and contractors frequently experience difficulty in placing requirements. Prices are steadier with buyers quoting average of 10 cents per pound in place.

Chicago—Many inquiries for reinforcing steel are being passed over by suppliers. Jobs for 100 tons or less get more favorable reception than larger ones.

Los Angeles—Reinforcing bar sales have doubled and tripled. Producers are sold through September. Bank of America will construct a 12-story bank and office building here, and Hawaiian Hotels plans a hotel for Waikiki Beach in Honolulu.

Seattle—Several thousand tons of merchant and reinforcing bars have been placed with the two Seattle rolling mills in the last fortnight. Consumers are adding to inventory and quick delivery is requested.

Plates . . .

Plate Prices, Page 131

Pittsburgh—Mill quotas for August to plate fabricators are generally unchanged from depressed levels of recent months. Proposed schedule of 10,000 new freight cars per month beginning in January plus augmented steel requirements for petroleum industry is expected to force mills to increase plate output under some form of voluntary allocation to these and perhaps other preferred end uses. Fabricators experienced sharp improvement in order backlogs throughout July, notably from private sources.

New York—Some sheet mills likely will have to be converted to rolling of light plates, if car building and other mounting requirements are to be met. Railroads plan to build 122,000 additional freight cars, taking 2,500,000 tons of steel with plates high in volume.

Boston — Considerable tonnage of plates booked for fourth quarter remains to be scheduled, most producers moving cautiously beyond October. Plate fabricators in many cases delayed inventory building only to find limited openings available.

Philadelphia — While demand for light plates results in rationing to 25 per cent per order in some cases, an upturn in heavier material is noted with weldment requirements increasing. Plate mill capacity is taken, but not fully scheduled for fourth quarter.

Birmingham—Projected purchases of 122,000 freight cars means much new business for the Pullman plant at Bessemer which already is seeking to increase plate inventories.

Structural Shapes . . .

Structural Shape Prices, Page 131

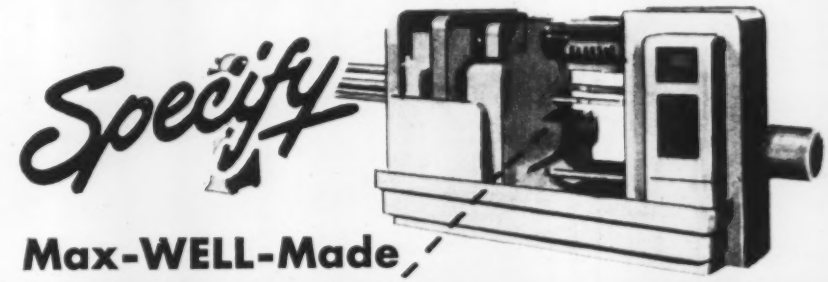
New York—Final steel contracts for the New Jersey turnpike are expected to be closed by Sept. 15; this project will have required close to 110,000 tons. Shop backlogs are heavier with volume of plain material tightening. Mills are practically booked for fourth quarter, but have not scheduled beyond October in most cases.

Boston — Fabricating shop backlogs extend well into fourth quarter in more cases; not all are covered on plain material and their allocations from mills are being revised downward for that period.

Philadelphia—Although inquiry for structurals is near post-war peak, shops are more selective in accepting forward contracts due to more extended deliveries on plain material. Structural mills are practically booked for this year. Some fabricators doubt plain material will be available to meet commitments and are not quoting on tonnage wanted in place beyond January.

Pittsburgh—A substantial improvement in inquiries for structural shapes from private sources has developed in recent weeks. Bulk of bridge work for Pennsylvania turnpike and Penn-Lincoln Parkway has been awarded.

Los Angeles—Producers are sold through third quarter and are not scheduling beyond September.



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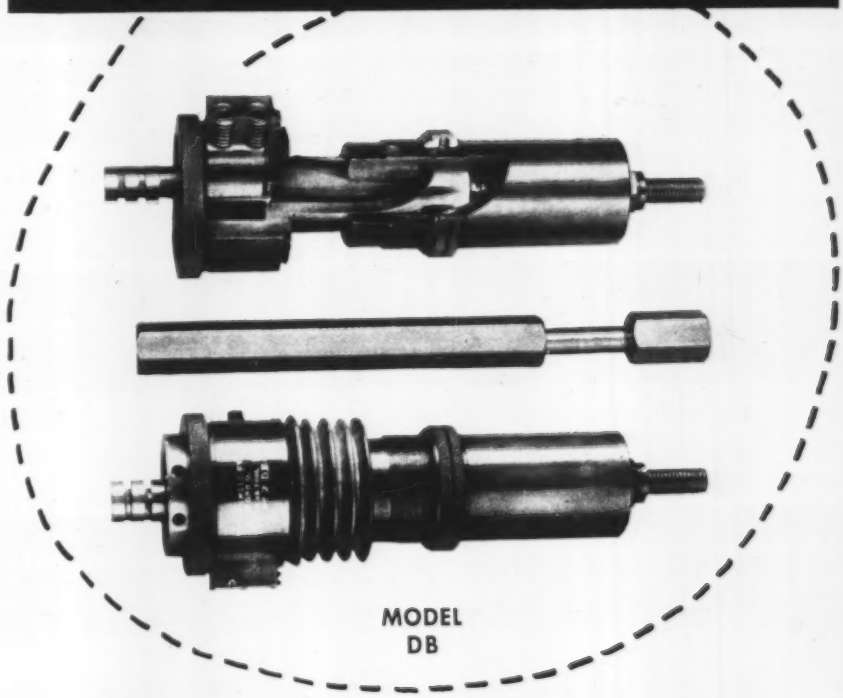

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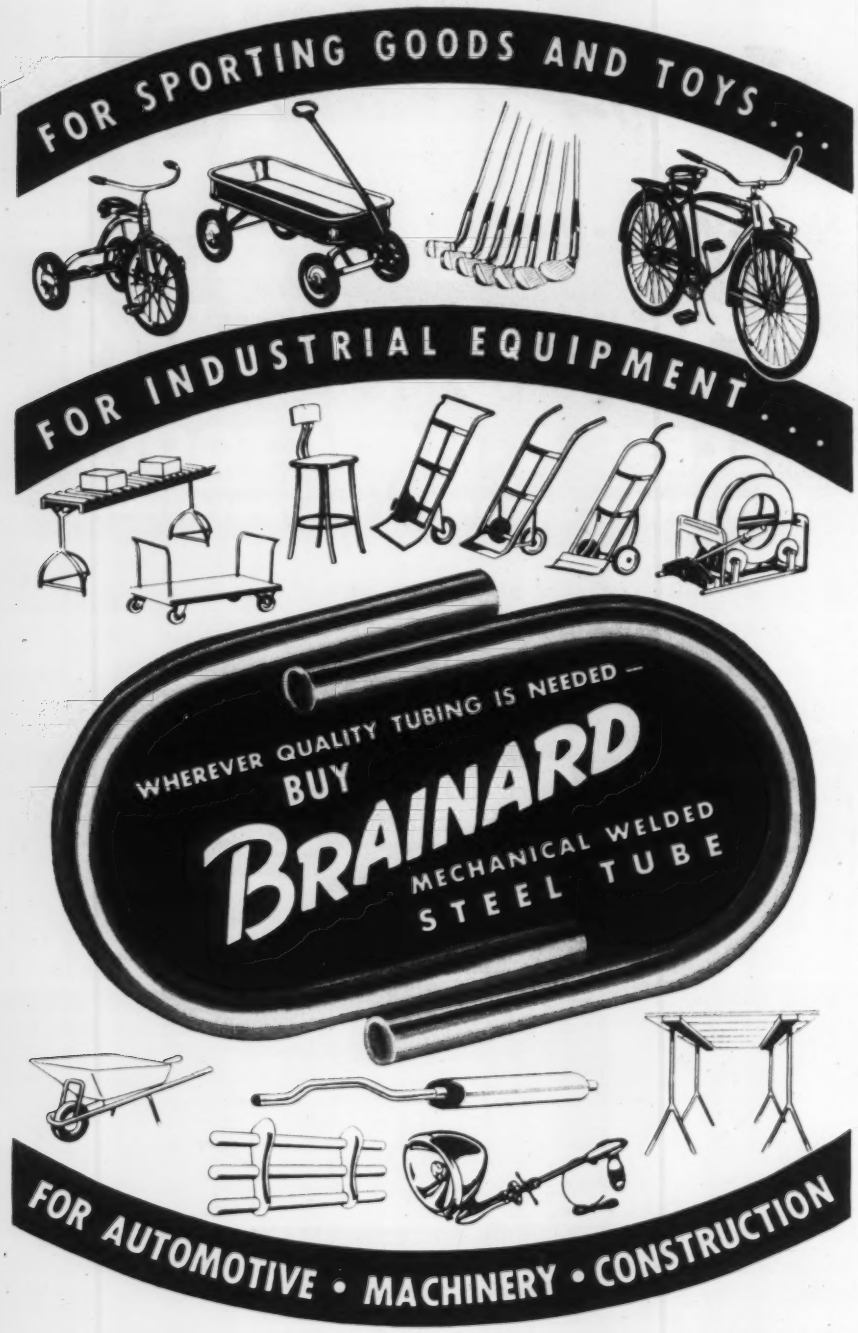
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Wire . . .

Wire Prices, Page 133

New York—More finished wire products will be allocated by mills in the fourth quarter. Open capacity for high carbon specialties in fourth quarter is limited, while low carbon deliveries are more extended. 10 weeks for some products. In trying to accumulate inventory, consumers are offering duplicate orders, but few are registered.

Birmingham—Most wire buyers are asking for increased tonnages. But mills are unable to comply with these requests. Active construction program maintains demand for nails.

Los Angeles—Scare buying has swept nails from the market. Only two weeks ago this district was glutted with domestic and foreign nails—now they are scarce. Producers put all wire products except nuts and bolts on allocation.

San Francisco—Demand for wire and nails is heavy due to boom in building, plus buying for inventory. Large cargoes of wire products have been landed here from Holland, Belgium and Germany. They include 14,347 coils of galvanized wire and 1725 kegs of nails.

Tin Plate . . .

Tin Plate Prices, Page 132

Pittsburgh — No preference has been extended to the relatively few orders that tin plate producers have received covering terne plate for shell container ends. Pressure for increased tin plate allotments is extremely heavy. Production schedules are filled through September and tentative commitments for final three months indicate full capacity output through remainder of this year. Mill tin plate warehouse stocks are being depleted rapidly while inventories at customers' plants are low.

Tungsten Ore . . .

New York—Wolframite has advanced 50 cents per unit to $24.50 to $24.75 per net ton unit, duty paid. Some mines are down and demand is improving. Scheelite prices also are stronger with foreign ore sales on basis of $21.50 per net ton unit in bond, or about $27.50.

Tubular Goods . . .

Tubular Goods Prices, Page 134

Beaver Falls, Pa.—Babcock & Wilcox Tube Co. increased base price on seamless stainless steel tubing (alloys containing over 10 per cent chromium) 1.50 cents a net pound, Aug. 1. Similar increase was made on all seamless chromium-molybdenum alloy steel tubing having chromium content over 4 per cent.

Pittsburgh—Sharp increase in demand for carbon and alloy seamless mechanical and pressure tubing has forced more companies to distribute output under strict allotment. A situation approaching "panic" buying is noted for nearly all tubular products. Tubing requirements for tank treads are increasing.

Pig Iron . . .

Pig Iron Prices, Page 130

Pittsburgh—Pent up demand for merchant foundry iron, which accumulated throughout 60 days shutdown of Neville Island, Pa., stack for relining, in combination with increased requirements developing out of augmented freight car construction and improved order volume among jobbing shops are expected to result in tight supplies throughout 1950.

Philadelphia—Melt and shipments are heavier, but limited supply tends to retard efforts to build higher foundry inventories. Improvement in demand for castings is well spread. Buyers of foreign iron are paying slightly higher prices, sellers having effected advances of around $2 per ton in some instances.

Buffalo—Rush for pig iron is becoming greater as supplies fall short of meeting demands. While pressure for deliveries prevails, there are no serious curtailments in melting operations, since some buying is to build reserve stocks. Leading sellers are endeavoring to channel output where it is needed for immediate consumption.

Cleveland—Merchant pig iron sellers cannot accommodate all of the inquiry coming to them with the foundries seeking to build inventories. However, blast furnaces are operating at capacity and output is sufficient to support current foundry melting schedules. But no surplus is available to care for the excess inquiry arising from war "scare" ordering. Republic Steel Corp. is installing new facilities at its furnaces here which will materially increase basic pig iron production in 1951.

Birmingham—Pressure for pig iron intensifies. Regular merchant iron buyers are being supplied to the limit of furnaces' ability. But requests for extra tonnage present a supply problem.

San Francisco—Local brokers have received a shipment of 1005 long tons of Belgian and Luxemburg pig iron, the largest incoming cargo in several months.

Iron Ore . . .

Iron Ore Prices, Page 135

Cleveland — Shipments of Lake Superior iron ore are maintained at a high rate, totaling 2,826,408 tons and averaging 403,773 tons daily at United States ports for the week ended July 31. This brought the season's cumulative total to 33,181,112 tons, down 11,868,746 tons compared with the movement for the like 1949 period. Shipments from United States and Canadian ports totaled 2,905,141 tons for the week ended July 31 and 33,959,838 tons for the season to date.

Two subsidiaries of United States Steel Corp. plan to order immediate construction of four lake vessels. Pittsburgh Steamship Co., Cleveland, will order three standard bulk ore carriers of 18,000 gross tons capacity each at the summer emergency draft of 24.6 ft. Bradley Transportation Co., Rogers City, Mich., will order a self-loading limestone carrier, also of 18,000 tons capacity.

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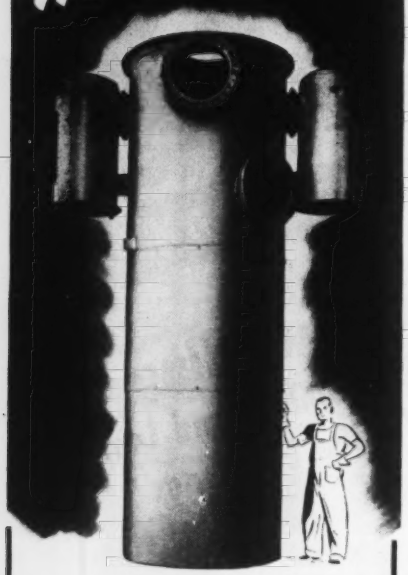

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Offerings on Gray Market Gain

Cleveland—Reports are heard in this area of increasing activity of gray market operators, especially in sheets. On hot-rolled they are reported asking 9 cents per lb and up, which compares with 3.35c f.o.b. mill. So far as can be learned the gray market operators pick up surplus lots here and there but such surplus is a rarity these days so that total gray market offerings do not bulk very large. Even then, most consumers still are not sufficiently desperate for supplies to pay the large premiums asked. Conversion steel business is heavier, but in this area also, those buyers willing to pay the premiums asked are running into difficulty lining up mill rolling time even where they are able to provide sheet bars.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 134

Pittsburgh—Producers of fasteners are operating 5 days per week. Demand is expected to register greater gains over coming months, due to augmented freight car construction program. Growing demand has reduced inventories. Producers of pole line hardware recently advanced prices 12.5 per cent

Rails, Cars . . .

Track Material Prices, Page 133

Pittsburgh — Rush for railroad equipment is reflected in intensified efforts to obtain steel for October delivery and succeeding months for 10,000 cars per month output starting in January. It is estimated carriers require an additional 122,000 cars. Industry officials recently indicated they soon would place orders for about 63,000 units, from stated requirements determined at the meeting, after allowing for approximately 40,000 cars on order July 1.

Birmingham—St. Louis, San Francisco, railroad has placed an order with the Tennessee Coal, Iron & Railroad Co. for 27,500 tons of rails and accessories. The Frisco has ordered 500 fifty-ton all steel box cars from the Bessemer plant of Pullman Standard Car Mfg. Co.

Birmingham's two major railroad shops, Finley of the Southern and Boyles of the L. & N., have speeded their car repair programs. A five day week is maintained in the heavy repair departments and seven days at Finley's light repair department.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 134

Cleveland — Shortage of foundry coke in this area is increasingly noticeable and buyers are reaching far afield for supplies. Some fuel is reported being brought in from southern producing points. Local sellers are distributing available supplies as equitably as possible, but there just isn't enough to meet all demands.

Pittsburgh — Supply of coke is ample to meet projected requirements over coming months. Foundries have fairly good stocks despite marked improvement in operations.

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Refractories . . .

Refractories Prices, Page 135

Pittsburghh—Coke oven and open-hearth modernization and expansion programs account for a large portion of current refractory brick demand. Crucible Steel Co. of America is enlarging its open hearth furnaces at Midland, Pa., plant, while Jones & Laughlin's open-hearth expansion program at Pittsburgh Works soon will reach the construction stage. Bethlehem Steel is considering modernizing byproduct ovens at Johnstown, Pa. Contracts were awarded short time ago on 59 new coke ovens of Aliquippa plant of Jones & Laughlin, and relining of two batteries of 87 ovens each for Carnegie's Clairton Works with two additional batteries scheduled for relining later this year. Clay brick still is available from stock, while deliveries on silica are extended 6 to 8 weeks.

Scrap . . .

Scrap Prices, Page 133

Pittsburgh—Activity in scrap was restricted largely to cast grades last week with prices advancing $1 to $3 a ton. Substantial increase in orders among jobbing foundries and captive interests is forcing steady uptrend in production with consequent tightening in supply of cast scrap grades. Low phos grades have shared in the price rise.

New York—The steel industry is importing between 400,000 and 500,000 tons of high-quality scrap to be delivered over remainder of the year at prices somewhat under those in the American market. Robert W. Wolcott, chairman, Committee on Iron & Steel Scrap, American Iron & Steel Institute, says export licenses have been granted on the full tonnage.

New York—Several grades steelmaking scrap have advanced, including No. 1 heavy melting, No. 1 busheling, No. 1 bundles and machine shop turnings. Cast is firm.

Boston—Heavy melting steel scrap is $1 higher at $30, shipping point. Spread between the two heavy melting grades holds to around six dollars ton. Most lighter grades also share in the advance. Cast buying is slightly stronger.

Philadelphia—Prices are firm and lean toward stronger side with electric furnace bundles $2.50 higher at $36.50.

Buffalo — With dealers generally anticipating the eventual announcement of price controls, the scrap market is content to mark time at present levels.

Cleveland—Definitely bullish trend is developing in the scrap market. How rapidly it will gather speed and how high it will carry prices is problematical, but consensus in the trade is that the pending stand-by government controls will prevent a "runaway" market. Heavy melting steel and low phos are up $2 a ton; turning grades, $3; cast grades, $1.

Cincinnati—Heavy melting steel is $1 higher at $38; other steelmaking grades also are higher on the basis of recent mill purchases. Prices on cast grades are strong but unchanged.

Chicago—Scrap prices on heavy melting grades remain unchanged. Strength has developed in turnings and borings, electric furnace and several railroad grades. Advances range from $1 to $3 a ton on the turnings grades and $1 to $4 on the railroad items.

Birmingham — The scrap market here is exceptionally strong due largely to lack of scrap movement.

Los Angeles—Mills advanced most scrap offering prices $1.50 with the exception of turnings.

Seattle—Offerings of steel scrap in the local market are not liberal, although mills report no actual shortage. Heavy melting steel scrap advanced $4 a ton last week in this and the Portland, Oreg., districts.

Warehouse . . .

Warehouse Prices, Page 135

Cleveland—Steel buyers are meeting with little success in augmenting their steel supplies from warehouse stocks. Distributors are allotting tonnage carefully to customers and are accepting little business from newcomers. Warehouse operators expect supply conditions to gradually deteriorate under the impact of expanding war demands

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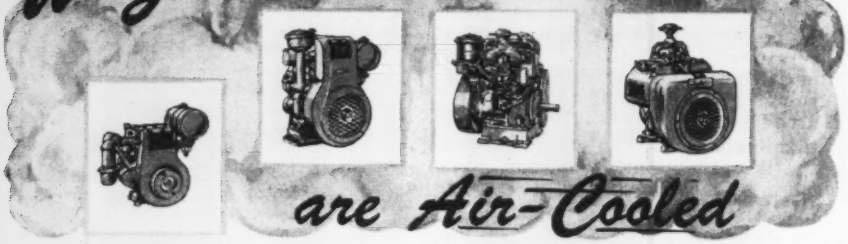

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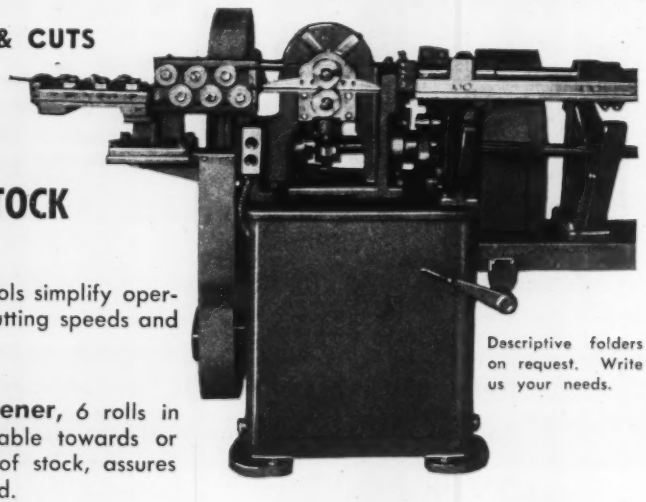

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New York—Although warehouses are screening orders, steel is moving out faster than arrivals. Not only are gaps appearing in flat-rolled inventories, but also in plates, shapes and bars. Distributors are behind on deliveries.

Chicago—Smaller consumers are mystified at their inability to be accommodated by their regular warehouse sources. Because warehouse inventories are low and depleted, consumers are being forced to spend a large amount of time shopping around, usually without success.

Los Angeles—Zooming warehouse activity pushed July sales 50 per cent ahead of those in June. Warehouses are allocating slim stocks. Prices on cold-rolled strip are up 35 cents per 100 lb. and galvanized sheets 40 cents.

San Francisco—Pressure on distributors is increasing as difficulty in obtaining steel from mills grows.

Seattle—Distributors report a rush of buying. Stocks of scarce items, sheets particularly, are exhausted.

Canada . . .

Toronto, Ont.—Production of finished steel products in Canada declined to 325,448 net tons in April from 361,761 tons in March and 331,688 tons in April, 1949. Shipments for sale in April dropped to 216,723 net tons from 358,956 tons in March and 248,165 tons in April, 1949.

Shipments for sale in April included 6866 tons of semifinished shapes; 9660 tons of structurals; 13,451 tons of plates; 38,886 tons of rails; 8083 tons of tie plates and track material; 40,124 tons of hot-rolled bars; 15,370 tons of pipes and tubes; 24,236 tons of wire rods; 23,052 tons of black sheets; 7408 tons of galvanized sheets; 5380 tons of castings; and 14,207 tons of other rolled products.

STRUCTURAL SHAPES . . .

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1250 tons, apartment, Bing & Bing, 84th street and East River drive, New York, to Harris Structural Steel Co., that city.

680 tons, office building, Connecticut Light & Power Co., Berlin, Conn., to Topper & Griggs, Hartford, Conn.; Bethlehem Fabricators Inc., Bethlehem, Pa., to fabricate.

650 tons, building, Ciba Pharmaceutical Co., Inc., Summit, N. J., to Bethlehem Steel Co.,

620 tons, 382-ft multiple span rolled beam viaduct, Derby, Conn., to Bethlehem Steel Co.; Mariani Construction Co., New Haven, general contractor.

550 tons, municipal bus terminal and parking garage, Bridgeport, Conn., to American Bridge Co., Pittsburgh.

465 tons, five-leaf bascule bridge with I-beam approaches, Grand Isle-North Hero, Vt., to American Bridge Co., Pittsburgh; Lambert Construction Co., White River Junction, Vt., general contractor. Work also includes 175 tons of billet steel for counterweights and 170 tons of steel punchings.

410 tons, state highway bridge, York county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.

340 tons, apartment, N. Sheridan and Ellwood avenues, Mt. Vernon, N. Y., to Grand Iron Works Inc., New York.

200 tons, field house, U. S. Engineer, Fort Monmouth, N. J., to Park Iron Works, Asbury, N. J.

175 tons, dormitories, state school, Exeter, R. I., to Providence Steel & Iron Co., Provi-

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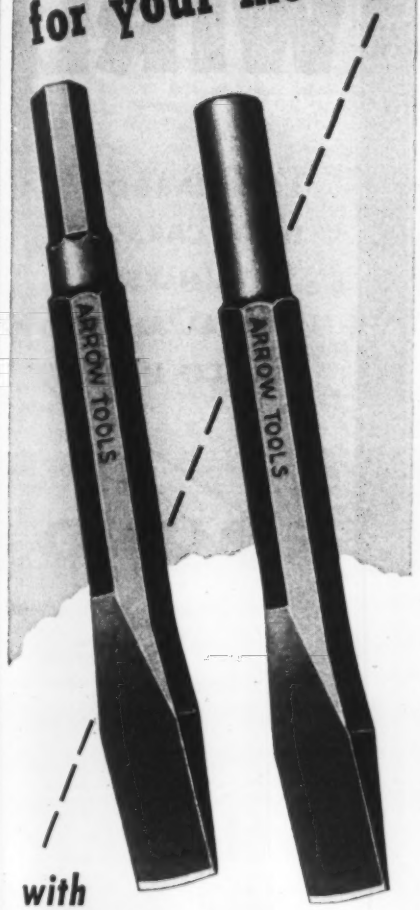
for your money



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ARROW TOOLS inc.
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dence, R. I.; Joseph P. Flynn, Providence, general contractor; bars awarded Plantations Steel Co., Providence.

160 tons, additions, county hospital, Braintree, Mass., to Groisser & Shlager Iron Works, Boston; Poorvu Construction Co., Boston, general contractor; U. S. Supply Co., awarded 45 tons, reinforcing bars.

150 tons, building, Superior Tube Co., Collegeville, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

145 tons, state highway bridge, Jefferson county, Pennsylvania, to Fort Pitt Bridge Works, Pittsburgh.

115 tons, engineering bulding, Howard University, Washington, to Barbor & Ross Co., that city; Cramer-Vollmerhausen Co., Washington, general contractor.

110 tons, Bucklin Point sewage disposal plant, Providence, R. I., to Groisser & Shlager Iron Works, Boston; F. H. McGraw & Co., Hartford, Conn., general contractor.

109 tons, including 25 tons reinforcing, Savage river bridge, Alaska, to Breeden & Smith, Anchorage, low $84,965, to Alaska Road Commission; materials furnished by government.

100 tons, remodeling Seattle ice arena, to Pacific Car & Foundry Co., Seattle.

100 tons, state highway bridge, Greenfield, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; Kelleher Corp., Turners Falls, Mass., general contractor; Northern Steel Co., Boston, awarded 70 tons, reinforcing bars.

100 tons or more, school, Dover, N. H., to Lyons Iron Works, Manchester, N. H.; Pitman & Brown Co., Salem, Mass., general contractor; Truscon Steel Co., Boston, awarded reinforcing bars.

100 tons or more, high school, Westport, Mass., to West End Iron Works, Cambridge, Mass.; Rich Bros. Construction Co., Boston, general contractor; Truscon Steel Co., Boston, awarded reinforcing bars.

100 tons, state bridge, Rutland, Vt., to Patch-Wagner Steel Co., Rutland; W. Robinson Martin, Manchester Center, Vt., general contractor.

100 tons or more, Carrie F. Wright Memorial Hospital, Newport, N. H., to Lyons Iron Works, Manchester, N. H.; T. W. Cunningham, Inc., Bangor, Me., general contractor; Bancroft & Martin Rolling Mills Co., Portland, Me., awarded reinforcing bars.

STRUCTURAL STEEL PENDING

1800 tons, building, Security Insurance Co., New Haven, Conn.

1400 tons, Grace Hospital, New Haven, Conn.

1000 tons, New Jersey turnpike section, Burlington-Mercer counties; G. M. Brewster & Sons Co., low.

690 tons, state highway bridge, Schuylkill county, Pennsylvania; S. J. Groves & Co., low on general contract.

650 tons, state highway bridge, Schuylkill county, Pennsylvania; bids Aug. 18, Harrisburg.

225 tons, supports, Rattlesnake tunnel, Colorado-Big Thompson project, Colorado, Bureau of Reclamation, Denver.

225 tons, bridge, Shasta dam, Central Valley project, California, Bureau of Reclamation, Denver.

180 tons, Seattle light department Bothell substation; bids Aug. 10.

150 tons, Waverly bridge, West Branch Sebasticook river, Pittsfield, Me.; bids Aug. 9, Augusta, Me.; five small bridges, three closing same date, take 270 tons.

100 tons, building, Pennsylvania Sugar Co., Philadelphia.

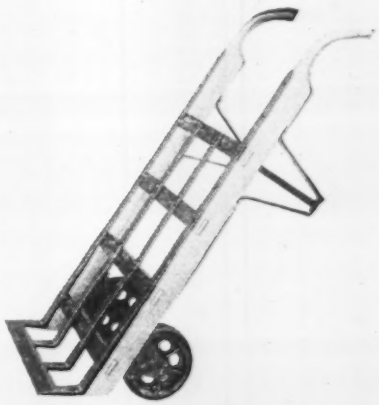
REINFORCING BARS . . .

REINFORCING BARS PLACED

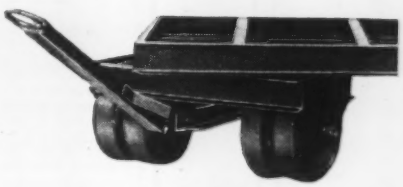
1400 tons, Highbridge traffic interchange, Major Deagan state highway, Bronx, N. Y., to Truscon Steel Co., Youngstown.

1000 tons, miscellaneous small contracts, to Northwest Steel Rolling Mills, Inc., Seattle.

900 tons, state highway, Bronx Expressway,



Trucks and Trailers



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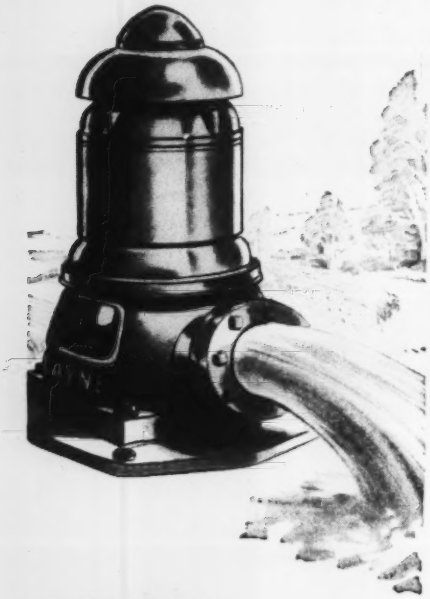

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New York, to Truscon Steel Co., Youngstown.

830 tons, 500-man barracks, Fort Richardson, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

635 tons, Bucklin Point sewage disposal plant, Providence, R. I., to Joseph T. Ryerson & Son Inc., Boston; F. H. McGraw & Co., Hartford, Conn., general contractor.

416 tons, alterations to General Hospital and nurses home, Madison, Wis., to Joseph T. Ryerson & Son Inc., Chicago; James McHugh Construction Co., Chicago, contractor.

375 tons, industrial plant, Butte, Mont., to Northwest Steel Rolling Mills Inc., Seattle.

350 tons, truck assembly building, International Harvester Co., Ft. Wayne, Ind., to Joseph T. Ryerson & Son Inc., Chicago; Ragnar Benson Inc., Chicago, contractor.

350 tons, 1200-L apartment, Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

350 tons, Maers apartment, Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

346 tons, Memorial library, University of Wisconsin, Madison, Wis., to Joseph T. Ryerson & Son Inc., Chicago; Gust K. Newberg Co., Chicago, contractor.

515 tons, engineering building, Howard University, Washington, to Rosslyn Steel & Cement Co., that city; Cramer-Vollmerhausen Co., Washington, general contractor.

315 tons, tuberculosis hospital, Tacoma, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

210 tons, engineering building, Lowell, Mass., to U. S. Steel Supply Co., Boston; Louis Marion & Son, Lowell, general contractor.

280 tons, unstated Navy installation, to Bethlehem Pacific Coast Steel Corp., Seattle.

195 tons, Foster avenue bridge, Chicago, to Olney J. Dean Steel Co., Chicago, through Edgar W. Zimmerman, Chicago; Michael J. McDermott & Co., Chicago, contractor.

130 tons, two bridges King county, Washington, to Bethlehem Pacific Coast Steel Corp., Seattle.

130 tons, Fairbanks, Alaska, public utilities, and addition to Security Market, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

116 tons, South Junior high school, Elgin, Ill., to Ceco Products Corp., Chicago.

112 tons, Tolt bridge, Seattle, and retaining walls Washington State College, Pullman, to Bethlehem Pacific Coast Steel Corp., Seattle.

111 tons, building, Midwest Interlibrary Center, Chicago, to Concrete Steel Co., Chicago.

110 tons, Seattle Bothell substation, to Northwest Steel Rolling Mills Inc., Seattle; Brazier Construction Co., Seattle, general contract, low $449,477.

103 tons, Thurston county, Washington, courthouse, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, building, Illinois Bell Telephone Co., Moline, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, three student union buildings, State College, Ellenburg, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Ketner Bros., Tacoma, general contractor.

100 tons, bridge, West river, Townshend, Vt., to Vermont Structural Steel Co., Burlington, Vt.; W. H. Morse Construction & Lumber Co., Bennington, Vt., general contractor; same shop awarded 500 tons, structural steel for project.

REINFORCING BARS PENDING

2000 tons, Stephen Foster homes, New York.

700 tons, foundations, Brooklyn Homes, New York; Horn Construction Co., New York, general contractor.

650 tons, bridges and state highway, Acton-Boxborough-Littleton-Harvard, Mass.; Gil Wuner Co. Inc., Malden, Mass., low.

275 tons, also 25 tons structurals, Washington state bridge, King county; bids to Olympia, Aug. 15.

227 tons, building, H. C. Christians Co., Chicago; bids in.

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

175 tons, highway and bridge, Bolton, Conn.; bids in.

100 tons, state bridge, Adams, Mass.; Henly-Lundgren Co., Shrewsbury, Mass., general contractor.

Unstated, 500,000-gal storage reservoir; bids to Mabel B. Darby, clerk, Selah, Wash., Aug. 11.

PLATES . . .

PLATES PLACED

1090 tons, five oil storage tanks, Esso-Standard Corp., Searsport, Me., to Hammond Iron Works, Warren, Pa.

500 tons, Point Lookout dam penstocks, to Consolidated Western Steel Corp., Seattle; Morrison-Kiewit-Macco general contractors.

400 tons, two oil storage tanks, T. A. D. Jones Co., New Haven, Conn., to Bethlehem Steel Co.

340 tons, oil storage tanks, The Texas Corp., Holland, Mich., to Chicago Bridge & Iron Co., Chicago.

200 tons, elevated steel water tank, Hazelwood water district, Portland, Oreg., to American Pipe & Construction Co., Portland.

150 tons, molasses tank, Toledo, O., to Bethlehem Steel Co.

PLATES PENDING

5000 tons, 158,000 ft 30, 22 and 20 in. diameter, 3/16, 5/16 and 1/4 inch, welded, electric fusion, water pipe; Medford Oreg., pending.

600 tons, 30 and 36 in., water pipe; American Pipe & Construction Co., Portland, low $115,781, to Spokane, Wash.

Unstated, three cement silos for Permanente Cement Co., Seattle; bids soon.

Unstated, two oil tanks and equipment; Williams Equipment Co., low $69,985, to U.S. Engineer, Anchorage, Alaska.

Unstated, 8600 ft welded steel; bids to Fort Lewis, Wash., Aug. 8.

Unstated, storage tank and standpipe; Ameri-Pipe and Construction Co., Portland, Oreg., low to Ranier, Wash.

PIPE . . .

CAST IRON PIPE PLACED

225 tons, 8 in., for Portland, Oreg., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

225 tons, 8 in., for Portland, Oreg., to E. N. Hallgren, Seattle, for American Cast Iron Pipe Co., Birmingham, Ala.

225 tons, 6 in., for Portland, Oreg., to Glamorgan Pipe Co., Birmingham, Ala.

CAST IRON PIPE PENDING

Unstated, 19,000 ft various sizes; bids to Charles Bridges, clerk, Kent, Wash., Aug. 7; also hydrants and fittings.

STEEL PIPE PENDING

Unstated, 22,000 ft 4 and 6 in., 10 gage; bids in to Vancouver, Wash.

Unstated, 1500 ft, 10 in, 10 gage and fittings; bids to Roy Hatmaker, clerk, Leavenworth, Wash., Aug. 8.

RAILS, CARS . . .

RAILROAD CARS PLACED

Boston & Maine, 750 fifty-ton box cars, to American Car & Foundry Co., New York.

Canadian National, 50 baggage cars and 100 seventy-ton covered hopper cars, to National Steel Car Corp., Hamilton, Ont.; 100 seventy-ton covered hopper cars and 6 sleeping cars, to Canadian Car & Foundry Co., Montreal, Que.

Canadian Pacific, 1000 fifty-ton box cars; 700 to National Steel Car Corp., Hamilton, Ont.; 300 to Eastern Car Co., Trenton, N. S.

Chicago & Eastern Illinois, 200 fifty-ton box cars, own shops, Danville, Ill.; also 25 additional hopper cars to Thrall Car Co., Chicago Heights, Ill.

Chicago, Milwaukee, St. Paul & Pacific, 600

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KRANE KAR swings load to either side

KRANE KAR is a lively swing-boom mobile crane, gas or diesel operated, of compact dimensions, short turning radius. It transports any load it can lift. Put it to work in any part of your plant, yard, or stores; it will speed up production, cut down handling costs. Available for service 24 hours a day, every day.

9 to 37 ft. booms or adjustable telescopic booms. Electric magnet, clam-shell bucket, and other accessories available. Write for Bulletin No. 79.

THE ORIGINAL SWING-BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
1¼, 2½, 5, AND 10 TON CAPACITIES
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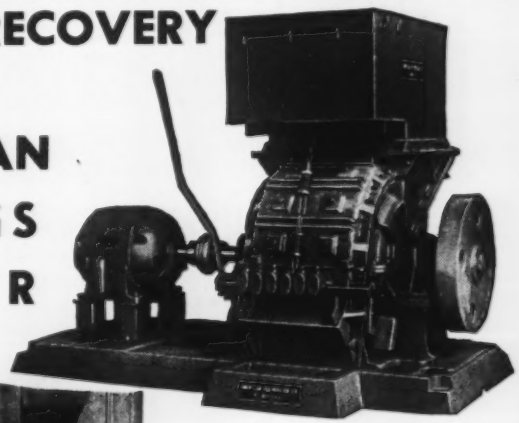

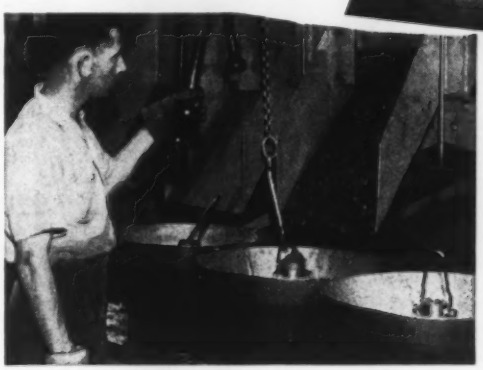

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refrigerator cars, own shops, Milwaukee.

Chicago, Rock Island & Pacific, 69 additional seventy-ton hopper cars to American Car & Foundry Co., increasing order from 100 to 169; also 500 fifty-ton flat cars, own shops.

Fruit Growers Express Co., 1000 refrigerator units, to Pacific Car & Foundry Co., Renton, Wash.

Marietta Army Transportation Corps Depot, 100 new design box cars to Pullman-Standard Car Mfg. Co., Chicago, $500,495.

Southern Pacific, 1000 fifty-ton box cars, to Pullman-Standard Car Co., Chicago.

Union Tank Car Co., 200 welded steel tank cars, for liquefied petroleum gases transportation, to own shops.

RAILROAD CARS PENDING

Atlantic Coast Line, 300 seventy-ton covered hoppers.

Baltimore & Ohio, 300 seventy-ton flat cars.

Baltimore & Ohio, underframes for 300 seventy-ton flat cars.

Chicago Transit Authority, 70 cars; St. Louis Car Co. low, $2,727,810. These are in addition to 130 others which St. Louis Car is building for CTA.

New York Central, 1500 seventy-ton drop end gondolas; 1500 fifty-five-ton hoppers; 2000 fifty-five-ton box; 500 fifty-five-ton, 50½-ft box, 500 forty-ton refrigerator. Carrier will also reconstruct 2000 box and 2000 gondolas in car building shops.

LOCOMOTIVES PLACED

Baltimore & Ohio, fourteen 1600-hp road freight units and twenty-four 1000-hp switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.; equipment is for account of Equitable Life Assurance Society for leasing to the railroad.

Canadian National, twenty-two 800-hp switching diesel locomotives, to General Motors Diesel Ltd., London, Ont.

Duluth, South Shore & Atlantic, five 1600-hp all-service locomotives and one 1600-hp switching locomotive, to Baldwin Locomotive Works, Eddystone, Pa.

Tennessee Coal, Iron & Railroad, two 1600-hp all-service locomotives and five 1280-hp switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Youngstown Sheet & Tube Co., three 750-hp switching locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

LOCOMOTIVES PENDING

Duluth, South Shore & Atlantic, three 1000-hp diesel switchers.

"Rodine" ushered in a new era in pickling. It has saved vast amounts of acid and metal all over the world.

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"Rodine" more than pays for itself in savings of acid and metal. Specify "Rodine" for improved pickling production.

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"Cuprodine" in a simple chemical immersion process coats both carbon and stainless steels with a thin, bright, adherent layer of copper. This coating prolongs die life and improves the drawing of wire, rod and tubing.

American Chemical Paint Co.
AMBLER ACP PENNA

FERROALLOYS

(Continued from Page 135)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C

3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Trungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca. 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

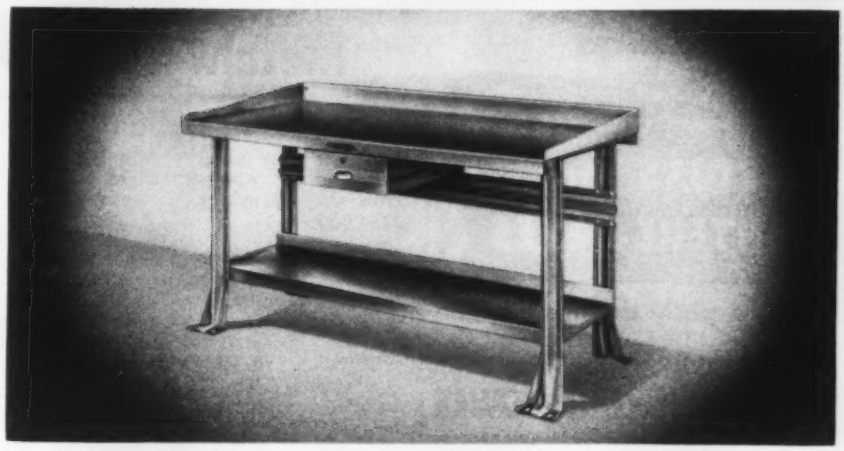
V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. Keller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.



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Interchangeable units readily adaptable to individual requirement. Easily bolted together to form continuous bench, yet may be taken down and reassembled as single units. Rigid, heavy-duty construction eliminates bolting to the floor, minimizes installation and maintenance.

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Full details in Bulletin 701.

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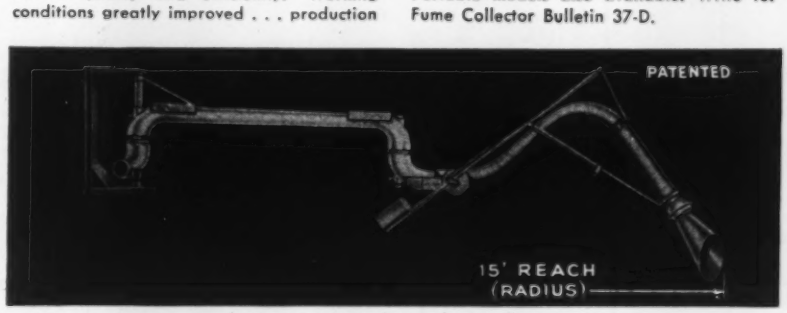
"Ruemelin Fume Collectors certainly have a powerful suction. We welders like them because they do a good job of taking away smoke and heat."

Long Reach Hinged Type Fume Collector Extends Working Range

Welding shops equipped with Ruemelin Fume Collectors enjoy a clean working atmosphere. Smoke, heat and gas are removed quickly and efficiently. Working conditions greatly improved . . . production increased. For the large welding booth, a long reach model (shown below) makes it easy to reach any welding job. 15 ft. and 18 ft. sizes. Available in wall type or underslung ceiling type brackets.

Portable models also available. Write for Fume Collector Bulletin 37-D.



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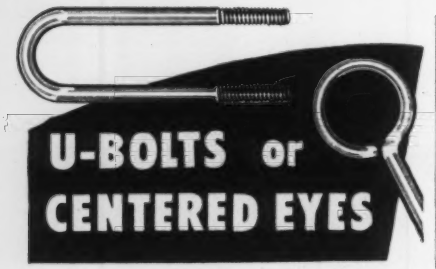

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

Alabama

Contract was awarded for an office building for **Sloss-Sheffield Steel & Iron Co.**, Birmingham, at a cost of $284,000.

California

Holbrook Merrill Co., San Francisco, leased a 10,000 sq ft, one story building in that city. The structure, formerly occupied by Lincoln Foundry, will be expanded to 15,000 sq ft and will house all of Holbrook Merrill's operations. The company plans to expand production of auto accessories. It now fabricates sheet metal to order for fabricating firms and produces a line of stainless steel kitchen equipment.

California

Marshallan Mfg. Co., Cleveland, manufacturer of metal utility tables, cabinets and typewriter tables, established a plant in Los Angeles to perform stamping and assembly of the firm's products.

California

Mar Vista Engineering Co., Los Angeles, started construction of a plant at the international airport tract, that city. Facilities for pilot production for the aircraft industry now located at the Venice plant will be moved to the new plant, scheduled for completion by Oct. 1.

California

Pelton Water Wheel Co., San Francisco, subsidiary of Baldwin Locomotive Works, Eddystone, Pa., received a $500,000 contract from the Bureau of Reclamation for design and manufacture of two large high-head Francis-type hydraulic turbines. They will be installed at the Pole Hill and Flatiron power plants of the Colorado-Big Thompson project, north of Denver. Pelton also has under order three turbines for the Owens Gorge project of Los Angeles, two for Southern California Edison Co., two for the McNary dam in Oregon, and five for utilities or municipalities in Canada, South America and the Philippines.

California

Ziegler Steel Service Co., Los Angeles, is distributing a wider range of products from its Los Angeles and Oakland, Calif., plants. The company is offering a complete range of sizes of band edge strip, round and flat bars, and mild steel angles in plain hot-rolled, hot-rolled pickled and oiled, and galvanized finishes. These are in addition to steel and aluminum sheets and plate which previously had been the company's sole interest.

California

Permanente Cement Co., Oakland, Calif., plans a $3.5 million expansion program designed to raise productive capacity by 5.6 million sacks of cement annually. A fifth kiln will be built at the company's San Jose, Calif., mill, increasing production about 25 per cent. New distribution facilities also are planned at Seattle, Wash.

Connecticutt

Ready Tool Co., Bridgeport, Conn., appointed Bryant & Cochran, Detroit, and Dependable Engineering Service Inc., Milwaukee and Chicago, as sales engineers in their respective areas.

Delaware

Pipe Linings Inc. was chartered by the secretary of state's office in Dover, Del. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Delaware

Welding Equipment & Supply Co. Inc.—machine tools—was chartered in Delaware. Capital of the firm is listed at $350,000. U. S. Corporation Co., Dover, Del., is serving as the principal office.

Illinois

Joslyn Mfg. & Supply Co., Chicago, is adding space to its plant at 3700 S. Morgan St. for the manufacture of pole line equipment. The company also operates a plant in Franklin Park, Ill.

Illinois

Portable Electric Tools Inc., Chicago, is adding about 36,000 sq ft to its electrical drill manufacturing plant.

Illinois

Illinois Condenser Co., Chicago, will begin construction soon of two buildings, totaling 10,000 sq ft of manufacturing area, adjacent to its plant at 1616 N. Throop St. The company makes capacitators for the radio and electrical industries.

Illinois

St. Charles Mfg. Co., St. Charles, Ill., makers of custom built steel kitchens, is constructing a larger plant.

Indiana

General American Transportation Corp., Chicago, is constructing an additional 60,000 sq ft of manufacturing space at its plastics unit in East Chicago, Ind.

Maryland

Alexander Milburn Inc., 1231 Ridgely St., Baltimore, was incorporated. The company will manufacture and market the Milburn line of welding equipment and supplies, including oxy-acetylene cutting and welding apparatus, regulators for oxygen, acetylene and other gases, accessories and supplies, and portable carbide lamps. Since 1945, Milburn equipment has been marketed by Black Mfg. Co., Parkton, Md.

Massachusetts

Lukens Steel Co., Coatesville, Pa., moved its district sales offices from 131 State St. to Statler Office Bldg., 20 Providence St., Boston 16. The announcement was made by J. Frederic Wiese, vice president in charge of sales.

Michigan

Ace Drill Corp., manufacturer of ground-from-the-solid drills and special tools, moved its plant and offices from Detroit to Adrian, Mich. The new plant more than doubles previous manufacturing area.

Michigan

Giffels & Vallet Inc., Detroit, is preparing architectural plans for a $3 million out-going patient clinic and for a $3 million medical research unit at University Hospital, **University of Michigan**, Ann Arbor, Mich.

New York

Nickel Cadmium Battery Corp., New York, appoints Frank B. Nugent Co., St. Paul, as its railway sales representative. Gordon H. Proffitt, Mat-

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"Shenango" Pig Iron
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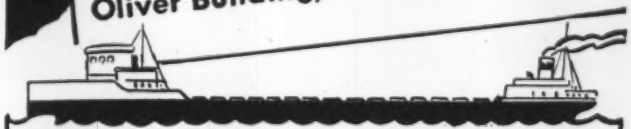

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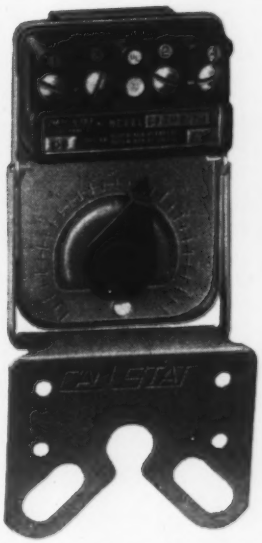
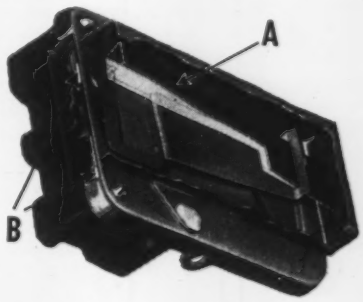


No. 42 — Product of Cam-Stat, Inc., Div. of the Paul Henry Company Los Angeles 34, California

This new Cam-Stat water heater thermostat features positive hammer action with clean make-and-break between electrical contacts, due to the advanced design of its snap switch mechanism, actuated by Chace Thermostatic Bimetal.



There is a generous gap between the bimetal actuating element (A) and the insulating member (B) which carries the contacts. This allows the bimetal to begin its motion and gain considerable kinetic energy before it starts actual breaking of the circuit, thus assuring a sharp, clean break. The extremely high deflection rate of Chace No. 6650 makes it an ideal bimetal for this application, where it might be considered an actuating "hammer."

This customer receives his bimetal in random coil lengths, ready for fabrication. We furnish Chace Thermostatic Bimetal to our customers in coils, strips, stampings or sub-assemblies, ready for installation in their products. Whatever your requirements, when designing an actuating element for your product in the fields of temperature control or response, Start Right . . . Consult An Expert . . . the Chace Application Engineer. You'll save time, money and effort.

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